AMERICAN GAS

Association

MONTHLY

JULY-AUGUST 1946 • VOL. 28 · NO. 7 AND 8

Copyright 1946, American Gas Association

"BUFFET" KITCHEN . . . latest "New Freedom Gas Kitchen" design . . . planned for you by the Gas Industry to make your new kitchen life easier and more *fun!* For instance, there's a special ventilating system to whisk away unwanted cooking odors, cooking heat and grease. And that's just *one* of the wonders in store for you . . . just *one* of the reasons why smart moderns everywhere are choosing Gas for these three big kitchen jobs, (and for house heating and air-conditioning as well!) Be smart yourself — join the nation-wide swing to Gas, today!

Short cuts to new Freedom!

1 CUT OUT COOKING CHORES . . .

Your new Gas range is so automatic it thinks for itself . . . turns on and off . . . cooks a delicious meal — all by a simple clock control! Makes every food taste better, too . . . whether it's a feather light cake from the air-conditioned oven — a flame roasted ham from the smokeless broiler — or a tasty stew from thrifty simmer top-burners. For nothing else brings out flavor like the flame. And nothing else equals the speed, ease and flexibility of flame-cooking on a new automatic Gas range built to "CP" standards.

2 CUT OUT MARKETING MONOTONY . . .

Your new economical, *silent* Gas refrigerator is streamlined inside and out! Arranged to store more foods (frozen foods, too!) . . . filled with *constant* circulated cold to keep them fresh *longer*. Best of all — there are no moving parts in the freezing system to wear out!

3 CUT OUT HOT WATER HEADACHES . . .

Your new automatic Gas water-heater simply ends "run-cold" worries! Gives you gallons of uniformly hot water 24 hours a day . . . replaces the supply so *fast* there's always *plenty* even for an automatic dishwasher and laundry. Amazingly thrifty, too! Plan for it now in your own "New Freedom Gas Kitchen"!

GAS

THE WONDER FLAME THAT COOLS AS WELL AS HEATS

AMERICAN GAS ASSOCIATION

The trend continues to gas in Canada, too, and the leading article by Edward J. Tucker, an A. G. A. director, makes it crystal clear why such is the case. Congratulations to our sister industry across the border! . . . One of the gas industry's most outstanding assets, the calibre of its leadership, is clearly evident in the slate of officers selected to head the Association next year. A look at the selections of the Nominating Committee will show that this asset remains unimpaired. . . . Hot water and hot weather go hand in hand but it takes the gas industry to supply the former instantly and in sufficient quantities to keep up with the latest automatic washing machines. Messrs. Thorp and Siskin provide significant data which may be used to spearhead water heating promotion in many communities. . . . Timely technical discussions in this issue consist of the highlights of the production and chemical conference; one of the conference papers, Mr. Boyer's excellent report on LP gas plant practice; and Mr. Adams' illuminating exposition of the factors involved in solving the moisture problem in housing. The latter paper marks the first time this problem has been analyzed in the pages of the MONTHLY. *It is particularly timely in view of the trend toward more compact houses, both prefabricated and conventional-type.*

EDITORIAL OFFICES:
AMERICAN GAS ASSOCIATION
420 LEXINGTON AVE., NEW YORK 17, N. Y.

CONTENTS FOR JULY-AUGUST 1946

FEATURES

THE CANADIAN GAS INDUSTRY—by Edward J. Tucker 303
NOMINATING COMMITTEE REPORTS FOR 1946-1947 306
HOT WATER FOR THE AUTOMATIC WASHER—by C. A. Thorp and Roy A. Siskin 308
EMPLOYEES' M AND H PROGRAM—by Norman D. Bradley . . . 311
PRIMARY AIR INJECTION—by Earl J. Weber 312
A. G. A. CONVENTION PROGRAM 314
LP GAS PLANT AND DISTRIBUTION PRACTICE—by E. G. Boyer . . 315
MOISTURE PROBLEM IN HOUSING—by E. C. Adams 321
PROGRAM FOR TRAINING SERVICEMEN—by C. C. Westmoreland . 323

SECTIONS

A CUSTOMER SERVICE POLICY—by Paul E. Ewers 335
AT THE FOOT OF THE RAINBOW—by James W. Carpenter . . . 339
SECTION'S PROGRAM REVIEWED 342
ON THE JOB WITH INDUSTRIAL MAINTENANCE—by Carl Wierum 344
PRODUCTION AND CHEMICAL CONFERENCE 346

DEPARTMENTS

CONVENTION CALENDAR 334
GAS GRAPEVINE 345
OBITUARY 352
LABORATORIES 353
ASSOCIATED ORGANIZATION ACTIVITIES 354
PERSONAL AND OTHERWISE 356
PERSONNEL SERVICE 360

• Subscription $3.00 a year - Published eleven times a year by the American Gas Association, Inc. Publication Office, American Building, Brattleboro, Vt. Publication is monthly except July and August which is a bi-monthly issue. Address all communications to American Building, Brattleboro, Vermont, or to 420 Lexington Ave., New York 17, N. Y. All manuscript copy for publication should be sent to the editorial offices in New York. The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein. Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, Feb. 10th, 1922, under the Act of March 3, 1879. Cable addresses: American Gas Association, "Amerigas, New York"; American Gas Association Testing Laboratories, "Amerigaslab, Cleveland."

JAMES M. BEALL, *Editor*

The Canadian Gas Industry

BY EDWARD J. TUCKER

Director and General Manager, Consumers Gas Co. of Toronto, Toronto, Ont.

THE Canadian gas industry has a long record of high achievement in carrying out its responsibilities as a public utility: a record that reflects the integrity and good faith which has at all times characterized the administration of the affairs of its component parts.

At the close of the year 1945 the population of Canada reached by gas service numbered approximately 4,300,000, or 37 per cent of the total. The number of customers served was 740,000, and the volume of gas sold during 1945 was 57,384 million cubic feet. Compared with similar data for the year 1925 these figures indicate a growth in the intervening twenty years of 44 per cent in the number of customers served, and 91 per cent in the volume of gas sold.

•

Prior to the war the gas industry in Canada was rendering an essential service to the nation's homes and factories and making an important contribution towards raising the standard of home life, and towards the improvement of industrial production. A goodly measure of the industry's energies was being devoted to finding ways and means through research and technical study to improve and cheapen its service to its customers.

The outbreak of war found the Canadian gas industry equipped and ready to play its role in Canada's war effort. This happy position resulted from the almost universal adoption by member companies of the industry of the forward-looking policy of being prepared at all times to meet greater demands for its service. Its production and distribution facilities were in excellent condition with ample margin of reserve plant over and above immediate requirements.

By operating these plants beyond their rated capacities and by keeping them in continuous operation through the deferring of much of the normal maintenance work, the gas industry was enabled to care for the full peacetime demands of its regular customers, as well as the additional gas requirements of old and new industrial establishments engaged in the production of war materials, munitions, and equipment. Under the circumstances, it was able to give gas of vital importance, however, in the early production of much-needed war materials and in this way the value to the country in wartime of a well-organized and up-to-date peacetime gas industry was strikingly, if quietly, demonstrated.

In some of the more concentrated industrial areas the gas companies were successful in meeting demands for gas reaching as high as six times their peacetime industrial loads, and this notwithstanding the acute shortages which existed at times in supplies of gas-making and other types of operating and maintenance materials. Perhaps the problem which gave the most concern to all was the lack of adequate manpower. In many instances greatly increased volumes of gas were produced and distributed with depleted or inexperienced staffs.

•

Operations of sales departments have to be revamped. To satisfy the prior claims of war to the available metals of construction, the government deemed it expedient to discourage the manufacture of domestic gas appliances by placing an excise tax of 25 per cent on their cost, and to conserve foreign exchange the importation of gas appliances was practically prohibited. In the almost entire absence of new appliances the sales staffs rendered a useful public service by giving instruction to customers in the care of their equipment.

Home Service departments, through their graduate dieticians, rendered a valuable national war service by directing their cooking lectures and radio talks to the subject of the

Part of address before 39th Annual Convention, Canadian Gas Association, Murray Bay, Quebec, June 19-21, 1946.

● Opposite: Unusual angled photograph of two types of gas holders. At right is a conventional water-sealed gas holder while the spherical container on the left is a type less frequently seen in the industry (Ewing Galloway Photo)

conservation of food and the art of preserving fruits and vegetables. Another service rendered by the home service staffs which was appreciated by the governments concerned, consisted of cooperating in campaigns designed to encourage the consumption of surplus foodstuffs for which the export market had become somewhat restricted.

Notwithstanding the governmental regulations relating to the control of commodity prices and the provisions of the wartime wages control order, practically all companies were faced with very substantial increases in the price of items entering into the cost of service.

The important factor of cost for all companies, namely, rates payable for labor, increased on the average some 35 per cent. For manufactured gas companies the cost of gas coal advanced about 40 per cent. These tremendous increases were all absorbed by the companies, while the cost of gas service to the public was maintained at pre-war levels.

Labor Relations Satisfactory

Few industries have been better or more faithfully served by their employees than the gas industry. Labor relations in recent times have been generally satisfactory. The industry is not liable to violent fluctuations in output and in consequence does not experience a heavy incidence of unemployment—security in employment has been very high.

It follows therefore that among the working forces of many gas companies there will be a liberal sprinkling of old employees who have spent all their working lives in the service; forty or more years of service being quite common. The manner in which these men carried on throughout the war to keep the service going, although for many of them retirement was long overdue, was very commendable.

The record of the Canadian gas industry's wartime service is replete with evidence of difficulties met and overcome. As an example: early in the war the companies which produce and distribute natural gas in Southwestern Ontario were faced with a serious situation due to the natural decline in the gas fields. These companies spared no effort to increase their supply of natural gas and drilling operations were carrried on ceaselessly. Nevertheless, the supply of natural gas still remained below normal, and it soon became necessary, in order to conserve natural gas reserves, and to meet the gas requirements of war industries, to take steps to augment the dwindling supply by the construction of artificial gas plants at Hamilton, Brantford, Windsor, and Sarnia.

At the first three of these locations, propane or butane was delivered from various oil refineries and converted into gas; while at Sarnia, refinery or "still" gas was used to produce a reformed refinery gas. These gases were added to the natural and coke oven gas supply to form mixtures which were maintained at a calorific value of 1,000 B.t.u. per cubic foot and a specific gravity that permitted their use in the consumers' appliances without the necessity of making burner adjustments. In this way very few consumers became aware of any change in the gas supplied to them, or of the ingenious methods devised to insure them a continuous service.

For the splendid way in which a difficult war emergency was met, this particular section of the Canadian gas industry is deserving of the highest commendation.

All Demands Met

Throughout the war the Canadian gas industry met every demand made upon it and acquitted itself with great credit. It displayed a truly patriotic spirit—asked for no subsidies or favors—accepted in good faith, and carried out to the letter, all governmental orders and regulations—extended its cooperation in many ways to the government—absorbed tremendous increases in the cost of raw materials and labor—overcame many difficulties and delays in securing labor and supplies, and in general devoted its resources and energies to the common cause.

Not the least of the Canadian gas industry's achievements during the war was its preparation for the postwar and peacetime period. Under the direction of its leaders an exhaustive study was made of possible postwar markets and of the factors of competition which were likely to be encountered. Ways and means were considered by which that competition might be met and overcome, to the end that the gas industry would be equipped to do all it should to promote prosperity for itself and to provide improved and more valuable service to its customers.

The findings and decisions of the Committee on Postwar Planning within the Canadian gas industry were presented and discussed at the convention held in 1944.

Many of the excellent and practical recommendations covering market and sales research have received the attention of individual companies since that time.

Support A. G. A. Research

In the matter of production research it was realized that it would be a much more practical thing to have this work carried out by a larger organization with far greater financial resources at its command than the Canadian gas industry could possibly have, and consequently many member companies readily accepted the opportunity to associate themselves with and give their support to the comprehensive program of research sponsored by the American Gas Association.

Both the volume and variety, and quality of the technical work and research undertaken by that body have reached an extremely high level. It is possible, however, that dissemination and interpretation of the results of their work could be, and no doubt will be, improved upon.

Because of the vast extent of Canada and the relative smallness of its population, coupled with the dual language problem in the Province of Quebec, it has not been found practical, so far, for the Canadian gas industry to sponsor a program of national advertising. However, by reason of the overflow into Canada of the circulation of the American national and women's magazines, the gas companies located in English-speaking communities are receiving some benefit from the expanded national advertising program of the American Gas Association, and recently a number of these companies upon recognizing this, have been happy to make voluntary contributions toward the cost on a pro-rata basis according to the local circulation.

National advertising raises the national prestige of an industry and promotes improved relations with the public. No doubt the Canadian gas industry will continue to look forward to the

time when it can embark on such a program of its own.

Cessation of hostilities has failed to bring normal conditions. Any notions we may have entertained of a smooth transition from the hectic conditions of wartime operation to the tranquil atmosphere of peacetime pursuits have been rudely dispelled. It is now 13 months since hostilities ended in Europe and 10 months since Japan surrendered, yet confusion and uncertainty still persist to an even greater degree than in the war years.

War's Aftermath

The tenseness in the international situation has had a disturbing influence on the domestic affairs of practically every nation in the world. Undoubtedly these conditions are the inevitable aftermath of war, but they are being unnecessarily increased and complicated here by prolonged strikes and labor unrest in both the United States and Canada. As a result, the scarcity of materials is placing further into the future the time when the industry can begin to satisfy the huge pent-up demand that prevails for all kinds of gas equipment and appliances.

It is a matter of keen disappointment that the public demand has not been met more speedily since the termination of war. The manufacturers of gas appliances are anxious to be of the greatest help in this regard and are doing what they can in a disheartening situation.

An important contribution could be made by gas companies, by their eliminating all unnecessary special requirements in their appliances and adopting greater uniformity in specifications of appliances.

This convention has gathered here to consider the problems of the gas industry in the period ahead—and while we are now pausing but a moment to glance back—we must forever keep our sights directed beyond the boundary lines of our present-day operations. In the future the public will expect a higher standard of comfort in their homes, and we should be determined that gas shall make the greatest contribution toward raising the standard of home life in Canada.

In working toward this objective we must emphasize good public service at all times. There must of course be the incentive of good profits if we are to be successful—and in this matter it should not be forgotten that the profit motive has been the dominant factor in providing for the people of Canada the highest standard of living in the world.

Six years of the stress and strain of wartime operation have left their mark on the plants and properties of gas companies, and much extension, reconstruction, and renewal work needs to be done. Just what form the new plant should take poses a serious problem for all. In view of the potential developments resulting from research and technological progress, the gas industry today may be said to be a new industry. In such circumstances we must keep ourselves in readiness to accept changes—we cannot afford ignorant opposition to change—we must face facts squarely and not allow prejudice to blur our vision.

You all have heard of Frederick A. Winsor, the flamboyant early promoter of the gas industry. Winsor was a man of little business experience, but possessed of an unbounded imagination. To help him in his campaign for financial support for his promotions, Winsor drew up a series of questions and answers. One question and its answer were as follows:

Q. Do you apprehend much opposition?

A. Not from sensible and enlightened persons; but I am fully prepared to meet and refute all obstinacy, prejudice, ignorance and malice.

Eventually we shall attain the smoother paths of peaceful progress and prosperity, and at the same time return to the days of active competition with other fuels. The present position of the gas industry in relation to competition indicates that it is capable of very considerable expansion, depending upon the vision and efficiency with which the industry is conducted.

It is for us now to lay well the foundations of the future.

Gas Revenues Gain in First Quarter

GAINS in revenues from the sale of utility gas in the residential and commercial fields for the first quarter of 1946, more than offset the decline in industrial gas revenues caused by the sharp decrease in war production, the American Gas Association statistical bureau reported June 25. Total revenues from gas utility sales for the three months ended March 31, 1946 amounted to $373,380,600, an increase of 2.9 per cent over total revenues of $362,637,300 in the like period of 1945. Revenues from residential gas sales were $253,462,700, a gain of 7.3 per cent over last year; commercial gas sales revenues totaled $51,886,300, an increase of 6.9 per cent; while revenues from sales of industrial gas amounted to $63,041,700, a decline of 11.9 per cent under the comparable period of 1945.

The total number of customers served by the gas industry increased during the quarter, aggregating 20,497,700 customers on March 31, 1946, a gain of 2.6 per cent over 19,976,900 customers a year earlier. Residential gas customers totaled 19,162,500, an increase of 2.4 per cent; commercial gas customers were 1,235,500, a gain of 5.9 per cent; and industrial gas customers totaled 85,700, an increase of 5.2 per cent over March 31, 1945.

Aggregate sales of gas for the industry, measured in MCF showed a slight decline because of the drop in volume sales to industrial users. For the quarter ended March 31, 1946, total sales were 811,429,000 MCF, a decrease of 2.2 per cent under sales of 830,094,000 MCF in the like 1945 quarter. Residential sales volume rose 9.5 per cent to total 371,934,500 MCF; commercial sales volume gained 6.4 per cent, amounting to 97,946,200 MCF, but these gains were insufficient to offset the drop in industrial sales from 354,909,600 MCF a year ago to 313,248,200 MCF in the first quarter of 1946, a decline of 11.7 per cent.

Initiating more complete breakdowns in gas utility statistics, the American Gas Association reported customers of manufactured gas companies gained 1.9 per cent to a total of 8,807,500 on March 31, 1946. Sales of manufactured gas for the quarter were 123,630,900 MCF, an increase of 1.7 per cent, and total manufactured gas sales revenues were $108,946,600, an increase of 3.7 per cent over a year ago.

Mixed gas utility companies had 2,537,100 customers on March 31, 1946, a gain of 3.0 per cent. Sales in MCF of mixed gas amounted to 49,433,400, a gain of 6.2 per cent, and total revenues of this branch of the gas industry amounted to $35,049,000 for the first quarter, an increase of 6.2 per cent.

Customers and revenues of the natural gas companies gained over a year ago. Total natural gas customers were 9,153,100 on March 31, 1946, a gain of 3.2 per cent; and total revenues from sales of natural gas in the quarter were $229,428,000, an increase of 2.2 per cent. Volume of sales of natural gas declined, principally in the industrial market, amounting to 638,354,700 MCF, compared with 661,981,700 MCF in the first quarter of 1945, a decline of 3.6 per cent. The drop in industrial sales for the quarter amounted to 11 per cent while natural gas sales for generating electricity were off 21.3 per cent in the 1946 quarter.

For Director →

F. M. Banks

R. G. Barnett

A. M. Beebee

James A. Brown

D. P. Hartson

Lyle C. Har

For President ↓

R. H. Hargrove

Nominating Committee

IN accordance with the provisions of Section 2, Article II of the Association's By-laws, the General Nominating Committee has submitted its nominations for officers and directors for the next fiscal year. In accordance with Section 3, Article II, any fifty member companies may make additional nominations on or before August 7.

Announcement is hereby made to the membership of the report of the General Nominating Committee which will be presented at the annual convention in Atlantic City, N. J., October 7-10.

For President—R. H. Hargrove, vice-president, United Gas Pipe Line Co., Shreveport, La.

For First Vice-President—Hudson W. Reed, president, The Philadelphia Gas Works Co., Philadelphia, Pa.

For Second Vice-President—Robert W. Hendee, president, Colorado Interstate Gas Co., Colorado Springs, Colorado.

For Treasurer—Edward F. Barrett, president, Long Island Lighting Co., Mineola, N. Y.

For Directors—two-year terms:

F. M. Banks, vice-president, Southern California Gas Co., Los Angeles, Calif.

R. G. Barnett, vice-president and general manager, Portland Gas & Coke Co., Portland, Ore.

A. M. Beebee, vice-president, Rochester Gas and Electric Corp., Rochester, N. Y.

James A. Brown, vice-president, Commonwealth & Southern Corp., New York, N. Y.

D. P. Hartson, vice-president, Equitable Gas Co., Pittsburgh, Pa.

Lyle C. Harvey, president, Bryant Heater Co., Cleveland, Ohio.

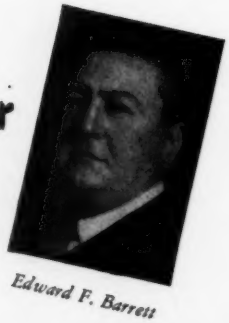
John C. Parker, vice-president, Consolidated Edison Co. of New York, Inc., New York, N. Y.

George F. Mitchell, president, The Peoples Gas Light & Coke Co., Chicago, Ill.

D. P. O'Keefe, president, O'Keefe &

For Chairman ↓

For Treasurer →



Edward F. Barrett

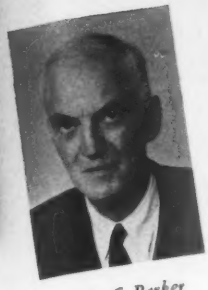
L. V. Watkins
Accounting Section

Karl Emmerling
Industrial & Commercial Gas Section

Alan P. Tappan
Manufacturers' Section

Wallace M
berlain, Re
Gas Se

. Goldsm
nical Secti



John C. Parker

George F. Mitchell

D. P. O'Keefe

Frank C. Smith

Alvan H. Stack

Reports for 1946-1947

Merritt Co., Los Angeles, Calif.

Frank C. Smith, president, Houston Natural Gas Corp., Houston, Texas.

A. H. Stack, president, The Tampa Gas Co., Tampa, Florida.

Respectfully submitted,
ELMER F. SCHMIDT, *Chairman*
BURT R. BAY
C. L. CAMPBELL
R. EARL FISHER
FREDERICK A. LYDECKER
D. P. O'KEEFE

Section Nominations

The following have been nominated by Section Nominating Committees to serve as Section officers for the next Association year:

Accounting Section: For Chairman—L. V. Watkins, Panhandle Eastern Pipe Line Co., New York, N. Y.
For Vice-Chairman—John A. Williams, Niagara Hudson Power Co., Syracuse, N. Y.

Industrial and Commercial Gas Section:
For Chairman—Karl Emmerling, The East Ohio Gas Co., Cleveland, Ohio.
For Vice-Chairman—Leon Ourusoff, Washington Gas Light Co., Washington, D. C.

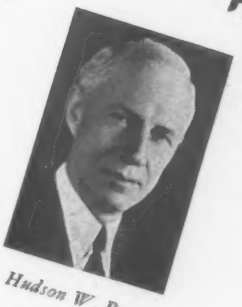
Manufacturers Section: For Chairman—Alan Tappan, Tappan Stove Co., Mansfield, Ohio.

Residential Gas Section: For Chairman—Wallace M. Chamberlain, Michigan Consolidated Gas Co., Grand Rapids, Mich.
For Vice-Chairman—C. S. Stackpole, Consolidated Gas, Electric Light and Power Co. of Baltimore, Baltimore, Md.

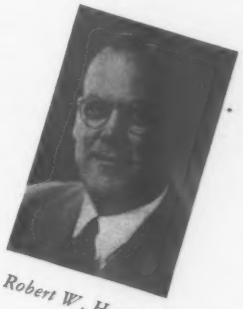
Technical Section: For Chairman—C. S. Goldsmith, The Brooklyn Union Gas Co., Brooklyn, N. Y.
For Vice-Chairman—A. C. Cherry, Cincinnati Gas & Electric Co., Cincinnati, Ohio.

Publicity and Advertising Committee: For Chairman—E. M. Tharp, Ohio Fuel Gas Co., Columbus, Ohio.

For Vice-President



Hudson W. Reed



Robert W. Hendee

For Vice Chairman

C. S. Goldsmith
Technical Section

E. M. Tharp
Publicity and Advertising Committee

John A. Williams
Accounting Section

Leon Ourusoff
Industrial & Commercial Gas Section

C. S. Stackpole
Residential Gas Section

A. C. Cherry
Technical Section

Hot Water for the Automatic Washer

Studies of hot water requirements of new-type automatic washers show gas industry in a favorable position to provide the service demanded and keep up with developments

Type of Westinghouse washer analyzed

BY C. A. THORP

Chief Research Engineer

AND ROY A. SISKIN

Research Engineer, American Gas Association Testing Laboratories

INTRODUCTION to the market of new-type automatic washing machines requiring large quantities of hot water well may make necessary the formulation of new concepts and methods of anticipating customer needs. Fortunately the gas industry is in a favorable position to provide the hot water service demanded and has an excellent backlog of technical information to readily speed the development of such new water heater designs as changing conditions may require.

Hot water requirements of the new automatic machines naturally depend on many variables. Among these are size and type of wash, temperature of both hot and cold water, the use of a soaking period, and water pressure. The latter is a factor insofar as greater or lesser pressure affects the quantity of water used in rinsing. It is appreciated that these variables are highly individual and differ from time to time. For example, while hot water temperature may be held within limits, temperature of cold inlet water fluctuates from season to season.

For the purpose of determining the quantity and temperature requirements of hot water necessary, data on the performance of two well known washers were secured from the respective manufacturers.

In Fig. 1 is presented a typical schedule of operations for washing cotton clothing in an automatic washer manufactured by the Bendix Home Appliance Company. Although the time necessary for each phase of the complete cycle may be changed at the discretion of the housewife, the recommended procedure requires a period of approximately 45 minutes. In this period, a total of 17.7 gallons of 160° F. water at 60 lbs. pressure is used. Since some authorities estimate the average family wash weighs from 24 to 27 lbs., and the capacity of the Bendix washer is 9 lbs., these batches, if washed consecutively, would require a total of 53.1 gallons of 160° F. water over a period of approximately 2½ hrs.

A similar time, temperature and hot water schedule for washing cotton clothing in a Westinghouse Electric Corporation automatic washer is presented in Fig. 2. As seen in this chart, a total of 17.8 gallons of 150° water is required to wash a 9 lb. load of cotton clothing in 42 minutes.

"Hot Water Requirements of Automatic Washers" published by Westinghouse Electric Corporation indicates that users of their products have an average of six 9-lb. loads per week. However, information derived from a survey on which the booklet was based shows that the average user washes only 2 consecutive loads at one time. Under these conditions, the requirements are 35.6 gallons of 150° F. water for a period of approximately 1½ hrs.

It is evident that a water heater manufacturer would have to design a unit to meet the most extreme conditions that might be encountered in order to satisfy users of automatic washing machines at all times. Thus, from the data presented, he might assume that a minimum withdrawal of 55 gallons of 160° F. water (with a temperature rise of approximately 110° F.) in a wash period of about 2½ hrs. duration would be suitable prerequisites. This quantity must be available at the start of the washing operation or the heater must have sufficient recovery capacity during the various phases of the complete washing operation.

The amount of heat added to the hot water used, the amount of heat which must be restored and the necessary gas input rate for this operation may be readily calculated. For the conditions assumed above, it may be shown that roughly 50,200 B.t.u. are removed and an input of 71,800 B.t.u. is required at a rate of 28,700 B.t.u. per hr. To allow for partial recovery during those phases when more heat is removed than restored, a factor of 10 per cent was added, thus increasing the estimated

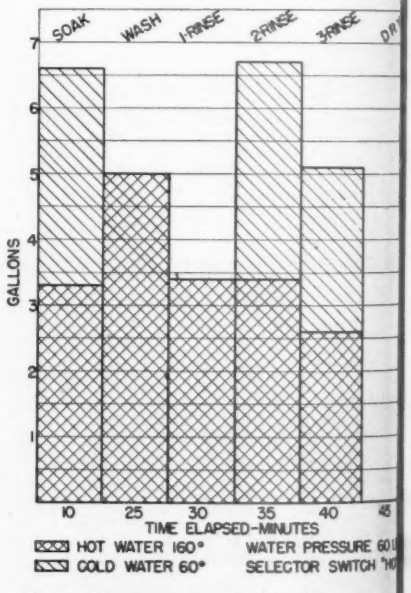


Fig. 1. Hot water consumption data on Bendix washer

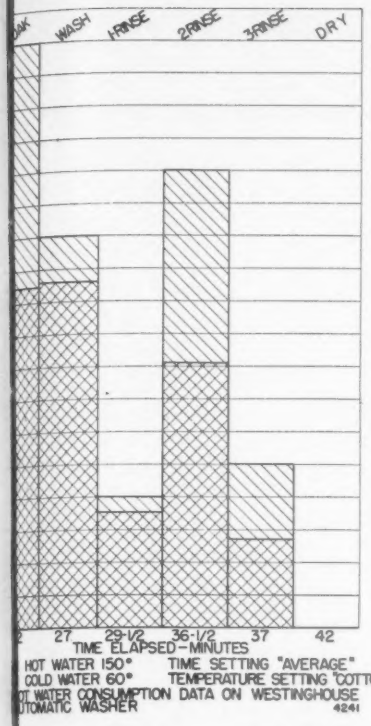


Fig. 2. Hot water consumption data on Westinghouse automatic washer

gas input rate to 31,500 B.t.u. per hr. Additional heat will be furnished during the interval in which batches of clothes are changed. However, it is expected that this will be sufficient to bring the stored water within a few degrees of the desired initial operating temperature.

The Pacific Coast Gas Association and various gas utilities recommend heaters of 30-gallon storage capacity for general household requirements. It may therefore be concluded that a heater of this capacity with a gas input rate of 31,500 B.t.u. per hr. would satisfactorily supply the requirements of an automatic-type washing machine.

Figs. 1 and 2 indicate that a maximum hot water draw never exceeds 5½ gallons. It would seem, therefore, that gas water heaters of smaller input rate might be satisfactory providing that they are designed to make the hot water immediately available at the top of the tank. This could be done by several methods as illustrated in Fig. 3. The conical baffle in tank A permits the water heated at the bottom of an underfired tank to rise to the top with only a small amount of mixing. This design is known as a spreader-type tank. Tank B in Fig. 3 illustrates the application of a second heating element located in the top portion of the tank, thereby heating the water at the top faster. Tank C employs a secondary heat interchanging fluid which could be directed either to the bottom, top or both as desired. The fourth tank illustrated in Fig. 3 is similar to tank B except for application of suitable baffles which are believed to be effective in reducing mixing.

Valuable aids to design are offered in the domestic gas water heating research bulletins published by the American Gas Association Testing Laboratories. In connection with proposed designs for obtaining adequate hot water at the top of the tank, reference to Bulletin No. 12, Principles of Gas Storage Water Heater Design for Maximum Hot Water Delivery, is particularly applicable. It covers the accumulation of hot water during the heating process as well as the characteristics of hot water delivered during continuous and intermittent draws. Consideration of the inlet water temperature is covered in Bulletin No. 19, Effect of Cold Inlet Water on Performance of Automatic Storage Gas Water Heaters. Research Bulletin No. 29 covers, as its title implies, Principles of Design and Sizing of Automatic Gas Water Heaters for Maximum Service Efficiency.

Upward Hot Water Trend

While these bulletins reflect the constant efforts of the gas industry toward improving design for the purpose of increasing customer satisfaction, it is recognized that the modern household uses more hot water than was previously estimated and at higher temperatures than previously recommended. These changing needs, brought about in some cases by new appliances such as the automatic washing machine, have been a challenge to the gas water heater industry. This, in turn, has made the industry more critical of automatic gas water heater performance.

In an attempt to meet changing and increasing demands for hot water service, the approval requirements subcommittee for domestic gas water heaters approached the problem by contending a heater should deliver some reasonable percentage of its storage capacity as useable hot water. Defining usable hot water as water at 120° F. or over, a series of comparative tests on contemporary underfired automatic storage heaters were conducted. Models with storage capacities from 15 to 75 gallons and of both internal and external type flues were included.

Following tests, the final procedure selected was as follows:

> Each heater was filled with water at a temperature of 70° F. plus or minus 2 degrees. Thermostat was set to shut off the main burner gas supply when temperature at the top of the tank reached 150° F. plus or minus 2 degrees. After 10 minutes, the heated water was drawn off and weighed using a rate of 3 gallons per minute for storage vessels of 25 gallons or less capacity and 5 gallons per minute for larger units, water temperatures being recorded every 10 pounds. During this operation, the thermostat controlled the gas supply as it would under typical service conditions.

Since withdrawal rates employed differ considerably from those of the new automatic washers, the data are not directly applicable to them. Nevertheless results are extremely interesting and inferences that can be made are pertinent to the general problem. It was shown that 83 per cent of the underfired automatic storage heaters could deliver 60 per cent of their capacity with a temperature decrease of not more than 10° F. from the initial temperature of 150° F. Moreover, as shown in Fig. 4, all of the heaters were found capable of delivering 70 per cent of their actual storage capacity of usable hot water and 71 per cent of these units could deliver 85 per cent before outlet temperature dropped below 120° F.

It was also significant that of the number of units which did not provide at least 85 per cent of their storage

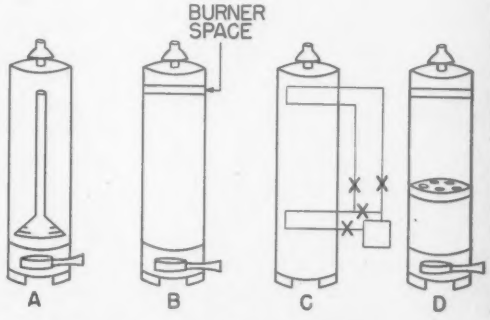


Fig. 3. Proposed designs of automatic storage water heaters to provide hot water at top of tank

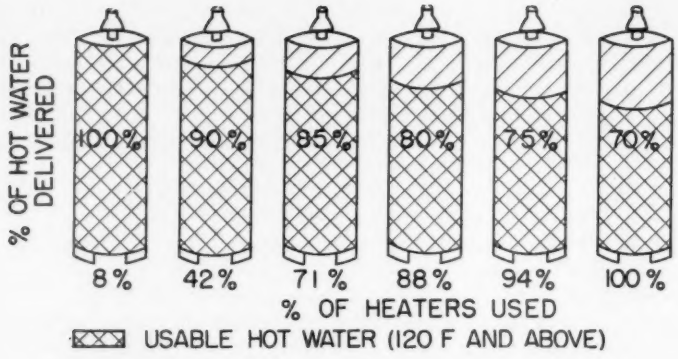


Fig. 4. Ability of heaters to deliver usable hot water

capacity, more than 60 per cent could be readily improved by application of the fundamental data, presented in Research Bulletin No. 12, on design and location of dip tubes to minimize mixing of the hot water with cold inlet water.

Consideration was also given to the temperature fluctuations of hot water at the top level of storage vessels after various types of withdrawals and during standby periods. In this connection, tests were conducted with heaters initially filled at 70° F. plus or minus 2 degrees and heated to 150° F. plus or minus 2 degrees. In one series amounts of water equivalent to the full, one-third and one-half tank capacity were withdrawn, 10, 3 and 1 minutes after the thermostat shut off. In a second series, amounts of water sufficient to cause the thermostat to function were withdrawn at the end of the same intervals of time until maximum build-up temperature at the top of the tank was reached. A third series similar to the standby test as specified in American Standard Approval Requirements for Gas Water Heaters was conducted without drawing water and using a recording potentiometer to show the temperature fluctuations 2 in. from the top of the tank for a period of 48 hrs.

Results of the first 2 series show that 80 per cent of the heaters studied functioned to turn on the gas supply before the temperature at the top level decreased 10 degrees. At the end of the heating cycles, the temperature at the top level was noticeably higher than the initial temperature. While these results indicated availability of usable hot water under the conditions of these tests, it was observed that as a result of the build-up temperatures, some of the heaters exceeded the critical point from the standpoint of liming and corrosion. On the other hand several heaters were capable of maintaining a build-up temperature of 10 degrees or less over the initial temperature setting.

Wide fluctuations of temperatures at the top of tank were experienced during the 48-hr. standby test, differences from 9° to 36° F. being observed. In 30 per cent of the heaters, the temperature did not decrease more than 10° F. below the initial setting of 150° F. Therefore, it might be concluded that in order to obtain water at a temperature sufficiently high for automatic washers with the remaining 70 per cent of the heaters, a higher initial setting of the thermostat is indicated. It is evident that improvement in this operating characteristic is highly desirable. It is of interest to note that a research project has already been started under supervision of the Technical Advisory Group for Gas Water Heating Research to which this problem has been referred.

From the foregoing analyses of customer hot water needs and the performance of contemporary gas water heaters, it may be concluded that the gas industry is in a favorable position to provide the hot water service demanded. It behooves each progressive water heater manufacturer, however, to keep abreast of changing customer demands and constantly check the operating characteristics of his product to maintain the present high level of customer satisfaction. In this way, we may expect a continued and ever increasing number of gas water heater sales.

Executive

● Management is the art of getting three men to do three men's work.—HAWLEY R. EVERHART in *The Saturday Evening Post.*

Hot water requirements of Bendix washers were studied by the Laboratories

Employees' M and H Program

Highly successful mutual plan brings unique hospitalization and other low-cost benefits without management help

BY NORMAN D. BRADLEY

Consolidated Natural Gas Company

M & H are two initials that have a very positive meaning to the employees of Consolidated Natural Gas Companies. To you, they would explain that M & H is their abbreviation for the Employees Mutual Medical and Hospitalization Association which stands for real financial assistance to its members when they need it.

The employees are proud of their association, and justly so, because it has many liberal provisions that they especially desired in this type of protection. Then, too, didn't they organize this association themselves; didn't they select the board of directors from their own members, and, perhaps even more importantly, didn't they finance the plan and incorporate into it the features that employees everywhere would consider most attractive?

Salient features particularly desirable in M & H plans and provided in their plan are: Low cost; no physical examination for membership; assistance in the payment of cost for sickness that does not require confinement or hospitalization; and, perhaps most important, an absolute free choice of physician.

Well may we have raised an eyebrow when such a noble idea was conceived, but meter readers, clerks, fitters and shop personnel have industriously set about their task, and today they can proudly say we have proven that it can be done. Now our efforts will be exerted to broaden the scope and benefits of the program. Indeed, steps already have been taken in this direction. From a cautious beginning, when membership was limited to employees only and the benefits, though generous, were carefully limited, eligibility now has been extended to cover, to some degree, wives and children of employees. This extended coverage was undertaken slowly and each step was justified by sound financial reserves. Today's broad coverage and low cost could hardly have been anticipated by the most optimistic supporters of the plans at their inception.

The low-cost feature is demonstrated by the simple statement in the by-laws: "The following is a schedule of monthly dues: Class A—Single Employees, $1.50-$2.00; Class B—Employee and Spouse, $2.25-$2.75; Class C—Employee, Spouse, and children (any number), $2.75-$3.15." For the purpose of providing a reserve fund, a three-month waiting period, during which dues were paid but the member was eligible for no benefits, was decided upon. A twelve-month membership requirement was placed on benefits for maternity care or chronic ailments.

The benefits provided vary slightly in the associations reflecting the local conditions and personalities involved in each. Generally, however, hospitalization benefits are provided for all three classes of membership as defined above, but the medical benefits are provided only for the employee members.

Treatment may be administered by any reputable physician (M.D.), Osteopath (D.O.), Dentist (D.D.S.) for extraction of teeth only (minor operation) who is regularly licensed by the state.

Maximum benefits in various plans range between $200 and $300 per year, and the payment of maximum benefits to an individual member for two consecutive years requires one full year of participation, during which no benefits are payable, before the member is again eligible for benefits.

Employee Mutual Medical and Hospital Associations are operated entirely by employee members who are elected to office. The forms and accounting methods are simple and prepared to suit their particular needs. The cost of all such items and office equipment is considered an operating expense. All officers contribute their time and efforts without pay; however, it has been the practice to authorize by vote the payment of an annual gratuity to the treasurer of the association.

Herein has been described an employee association in which the management of the company has taken no part beyond individual membership participation. There is, however, the need for the assistance or advice of a competent physician or medical director to aid in the determination of certain technical problems. This service may be made available through the Medical Department of the company.

Eight district Employee Mutual Medical and Hospitalization organizations are being operated by the employees of the Consolidated Natural Gas and Subsidiary Com- *(Continued on page 334)*

TYPICAL HOSPITALIZATION BENEFITS

Maximum of 21 days in one calendar year at $6.00 per day. (Tuberculosis Sanatoria and institutions maintained for the treatment of chronic diseases are generally excluded)		
Anaesthetic and operating room fees	Maximum each operation	$20.00
Dressings and laboratory fees	Maximum in any one calendar year	$25.00
X-Ray Fees	Maximum in any one calendar year	$25.00
(X-Ray therapy or diagnostic dental X-Ray is excluded except when the member is confined to home or hospital or in cases of suspected bone injury)		

Typical medical benefits are:

Major operations	Maximum	$100-$125
Minor operations	Maximum	$ 25-$ 50
Tonsilectomies	Maximum	$ 40-$ 55
Doctors' fees should be limited to a total of $50 in one calendar year payable as follows:		
Office calls	Maximum per call	$2
House calls	Maximum per call	$3
Specialist calls (limit 2 calls per year) maximum		$5
(One eye examination permitted every other benefit year payable as a specialist call)		

Primary Air Injection

New mathematical equation correlates individual components of burner design, providing for deviation from conventional form

BY EARL J. WEBER

American Gas Association Testing Laboratories

CARRYING forward the work of analyzing the many individual factors affecting atmospheric injection of air, new data which make it possible to include additional elements in burner design calculations have been developed by engineers of the American Gas Association Testing Laboratories.

The new factors, cast into a revised equation of an empirical nature, will help to bridge the present gap between design and performance and greatly aid the mathematical approach to atmospheric burner designs deviating from conventional or commonly accepted standards.

Providing engineers and designers with greater flexibility in the solution of their problems, the derivation and application of the new formula, briefly reviewed here, is fully reported in Research Bulletin No. 37, Primary Air Injection Characteristics of Atmospheric Gas Burners—Part II. The investigation was sponsored by the Committee on Domestic Gas Research and supplements previous results reported in Research Bulletin No. 26.

Heretofore no one relationship has existed defining primary air injection in terms of burner design and conditions of gas supply which included effects of throat size, venturi tube slope, ratio of throat area to port area, port size, port depth, input rate, gas pressure and specific gravity. As a result of the investigation all of these factors have been combined in the following relationship:

$$R = \frac{K\ F_r\ F_p\ {}^4\sqrt{Pd}\ \sqrt{\frac{540}{T}}}{Q_g^{0.45}\ \sqrt{d_m}}$$

Where:

- R = cu.ft. of air-gas mixture per cu.ft. of gas
- K = factor for throat size and venturi slope from Fig. A
- F_r = factor for throat to port area ratio from Fig. B
- F_p = factor for port size and depth from Fig. C
- P = gas pressure behind orifice in in. of water
- d = specific gravity of gas (air = 1.0)
- Q_g = gas rate, cu.ft. per hr.
- d_m = specific gravity of air-gas mixture (air = 1.0)
- T = absolute temperature (°F. + 460) of air-gas mixture in the burner head

The terms K, F_r, and F_p represent new factors not previously included.

The equation is solved for injection in terms of R. This is converted to air-gas ratio simply by subtracting one.

$$R = \frac{Qa + Qg}{Q_g} = \frac{Qa}{Q_g} + 1$$

or

$$\frac{Qa}{Qg} = R - 1$$

The air-gas ratio may be expressed in terms of per cent primary air by dividing by the air required per cu.ft. of the given gas for complete combustion.

The term "d_m" (sp. gr. of the air-gas mixture) appears in the right side of the equation and it would appear that this is an unknown until R is solved for, and yet R must be solved for without knowing "d_m." This difficulty may be circumvented by first solving for R, assuming a value of 1.0 for "d_m." With this approximate value of R, d_m may be calculated as shown below and then applied as a correction factor to the approximated R in the form of $\frac{1}{\sqrt{d_m}}$.

Usually only one approximation of R is required, although with low primary aeration (15% primary air or less) a "second-estimate" calculation becomes necessary.

The value of d_m is obtained as follows:

$$d_m = \frac{Q_g}{Q_m}\,d + \left(1 - \frac{Q_g}{Q_m}\right)$$

by definition:

$$\frac{Q_g}{Q_m} = \frac{1}{R}$$

$$d_m = \frac{d}{R} - \frac{1}{R} + 1$$

$$d_m = \left(\frac{d-1}{R}\right) + 1$$

An example would probably serve best in explaining the application of this injection equation. A burner is designed to operate at a rate of 20,000 B.t.u. per hour sq.in. of port area, the total rate being 25,000 B.t.u. per hour. The venturi has a ¾ in. throat and a 2 degree slope. Ports are No. 36 DMS and ⅜ in. deep. Gas supply is 1100 B.t.u. natural, 0.6 sp. gr.; air required for complete combustion, 10.4 cu.ft. per cu.ft. of gas and orifice pressure 6 in. water column. The problem is to determine the per cent primary air at which the burner would operate when the air-gas mixture leaving the ports is assumed to be 400° F.

Total port area $\frac{25{,}000}{20{,}000} = 1.25$ sq.in.

Throat area for a ¾ in. throat = 0.442 sq.in.

Throat to port area ratio = $\frac{0.442}{1.25} =$ 0.354

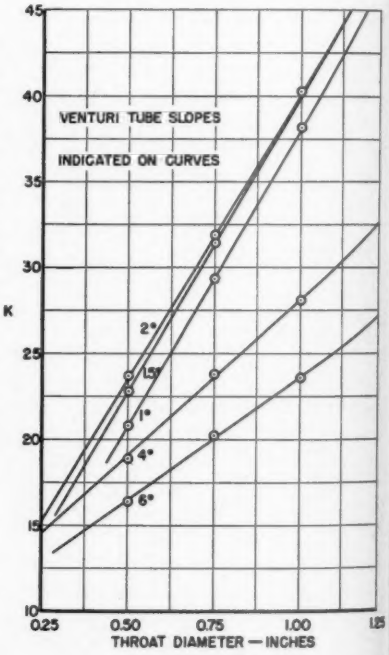


Fig. A. Effect of throat diameter and venturi slope on value of K

Gas input rate $= \frac{25{,}000}{1{,}100} = 22.7$ cu.ft. per hr.

Factor for a No. 36 DMS port, 3/8 in. deep from Fig. C is $0.89 = F_p$

K value for 3/4 in. throat, 2 degree venturi slope from Fig. A is 31.9

Factor for throat to port area ratio of 0.354 using a 2 degree venturi, from Fig. B, is $0.733 = F_r$. It will be noted that the curves of Fig. B are independent of throat diameter.

Substituting in equation:

$$R = \frac{31.9 \times 0.733 \times 0.89 * \sqrt{6 \times 0.6}\ \sqrt{\frac{540}{400+460}}}{22.7^{0.45}\ \sqrt{1}}$$

$R = 5.59$ cu.ft. of air-gas mixture per cu.ft. of gas per hr.

Since the value of d_m was assumed to be 1.0 the above value of R is an approximation. The value of d_m can now be ascertained from the approximate value of R.

$$\text{Since } d_m = \left(\frac{d-1}{R}\right)+1$$

$$d_m = \left(\frac{0.6-1}{5.59}\right)+1 = 0.928$$

The approximate value of R is now corrected for d_m as follows:

$$R = \frac{5.59}{\sqrt{0.928}} = 5.81 \text{ cu.ft. of air-gas mixture per cu.ft. of gas per hr.}$$

Since the air-gas ratio equals R — 1, this divided by the air required per cu.ft. of gas will give the per cent primary air injected.

$$\frac{5.81-1}{10.4} \times 100 = 46.2 \text{ per cent primary air}$$

Similar problems may be solved, selecting the proper values of the various factors from the figures.

The value of the equation is not only in solving for an unknown in the equation in a problem of burner design but also in predicting the effect of a change in any one of the many factors. Effect of a change increasing primary aeration is approximately squared when considering the gas rate if the same injection is maintained after the change as before. For example consider the change from a venturi slope of 1 degree to 2 degrees with a 3/4 in. throat maintaining the same throat to port area ratio and same primary air injection. From the equation it may be seen that under the above condition $Qg^{.45} = CK$ where C is the combination of all the other factors except the K value for the venturi tube. The value of C has been assumed to be constant for both conditions.

Then for the 2 degree slope:

$$Qg2^{0.45} = CK_2$$

and for the 1 degree slope:

$$Qg1^{0.45} = CK_1$$

$$\left(\frac{Qg2}{Qg1}\right)^{0.45} = \frac{K_2}{K_1}$$

From Fig. A, $K_2 = 31.9$ and $K_1 = 29.4$

$$0.45 \log \frac{Qg2}{Qg1} = \log \frac{31.9}{29.4}$$

$$\log \frac{Qg2}{Qg1} = \frac{1}{.45} \log 1.084$$

$$\frac{Qg2}{Qg1} = 1.2$$

In other words a change from a 1 degree slope to a 2 degree slope with a 3/4 in. throat permits a gas input rate 1.2 times the original rate if the primary aeration is maintained the same. A decrease in port depth will have the same tendencies. Of course this is all

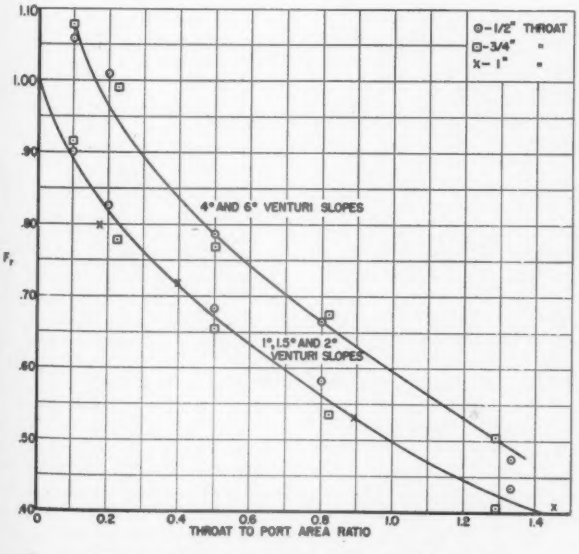


Fig. B. Effect of throat to port area ratio on value of F_r

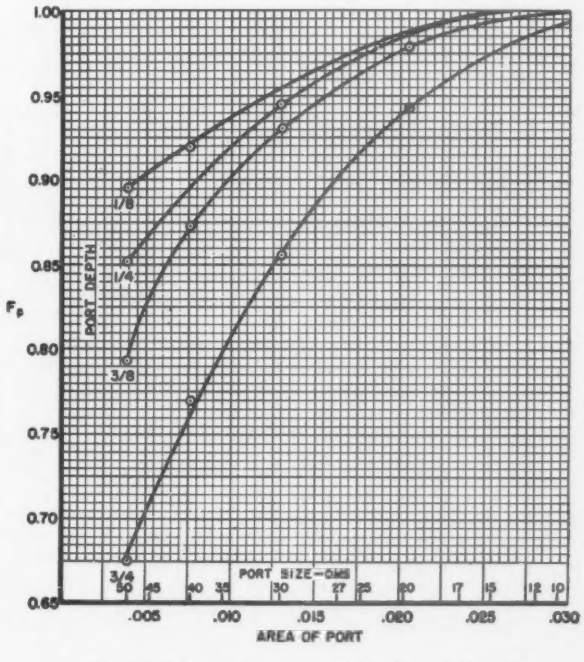


Fig. C. Effect of port size and depth on value of F_p

based on the assumption that the burning characteristics of the gas permit such an increase in gas rate.

Likewise it may be seen from the equation or rather from the K values of Fig. A that smaller burners are more efficient as injectors than larger ones. This arises from the fact that doubling the throat diameter does not double the injection.

Primary air injection constitutes only that phase of burner design dealing with delivery to the burner ports of an appropriate air-gas mixture. The other phase of burner design must consider the satisfactory flame characteristics of this mixture with due regard for the nature of the appliance, gas rate and burning speed of the gas. In reality it is this latter phase with all its factors that determine the value of primary air injection for which the burner should be designed.

In the selection of a primary air injection value *(Continued on page 334)*

A.G.A. Convention Program Keyed to New High in Member Interest

I. K. Peck

THE twenty-eighth annual convention of the American Gas Association at Atlantic City, during the week of October 7, promises to reach new high levels in entertainment and educational value, as well as in attendance, Irving K. Peck, chairman of the Convention Committee and vice-president and general manager of the Manufacturers Light and Heat Company of Pittsburgh, reports. The program is being carefully arranged, with every possible consideration being given to effect a proper balance of subjects of wide industry interest so that every member present will benefit through attendance at the convention.

The prevailing hotel situation makes it most advisable for members to secure their hotel reservations early—tomorrow may be too late. Copies of a hotel reservation blank were sent to all members of the Association by President Boothby April 5, recommending prompt attention. Additional copies of the blank may be secured by writing Kurwin R. Boyes, convention manager at Headquarters. Members are urged to share twin-bedded rooms wherever possible. All hotel reservation blanks should be sent to the Housing Bureau, 16 Central Pier, Atlantic City, New Jersey, and NOT to the American Gas Association.

On Monday morning, October 7, the Manufactured Gas Department will meet at the Traymore Hotel and the Natural Gas Department in the Claridge Hotel. In the afternoon an Employee Relations Forum will be held in the Auditorium.

General Sessions will be held in the Auditorium on Tuesday and Thursday mornings. Another General Session with entertainment features and two general addresses of interest to the delegates and their wives and the presentation of general awards will be held on Wednesday evening.

The Industrial and Commercial Gas Section will open its convention activities with a luncheon meeting at the Traymore on Tuesday, and will hold another meeting at the Traymore Hotel on Thursday afternoon.

The Residential Gas Section will hold its meetings in the Auditorium on Wednesday morning and Thursday afternoon.

The Home Service Breakfast, a popular feature of many past conventions, will be held at the Traymore Hotel Wednesday, and a Home Service Round-Table will be conducted at the Claridge Hotel on Tuesday afternoon.

The Accounting Section is planning a General Session on Tuesday afternoon and General Accounting and Customer Accounting Sessions on Wednesday morning at the Ritz Carlton Hotel.

The Technical Section will hold three sessions—all at the Ambasador Hotel Tuesday afternoon, Wednesday morning, and Thursday afternoon.

Friday, is being reserved for miscellaneous meetings, including committee meetings, which may be advisable. Every effort is being made by the Convention Committee to avoid conflict of meetings so that the gas men and women may attend all the meetings in which they have an interest.

The programs for the General Sessions to be held in the Auditorium Tuesday morning, Wednesday evening, and Thursday morning, are being arranged by the Convention Committee. The Personnel Commitee, of which Fred R. Rauch, vice-president, The Cincinnati Gas and Electric Company, is chairman, is arranging the program for the Employee Relations Forum to be held in the Auditorium on Monday afternoon. Mr. Rauch has appointed a subcommittee on this assignment consisting of R. S. Child, Central Hudson Gas and Electric Corporation; Gordon M. Peterson, Public Service Electric and Gas Company; L. M. Ayers, The Peoples Natural Gas Company; C. G. Simpson, The Philadelphia Gas Works Company and D. S. Sargent, Consolidated Edison Company of New York.

Manufacturer interest in the Exhibit of Gas Appliances and Equipment is running high, according to Harold Massey, assistant managing director of the Gas Appliance Manufacturers Association. To date 112 exhibitors have signed up for 63,000 square feet of space which represents 97 per cent of the maximum space taken at any previous exhibit in Atlantic City. Reservations for space continue to be made daily, and when the exhibit opens at 10:00 o'clock on Monday morning it is anticipated it will be the largest and best exhibit ever held by the gas industry.

Sketches submitted by exhibitors indicate exceptionally beautiful booth layouts and considerable ingenuity in the use of non-critical materials to provide attractive backgrounds. Servel, Inc., will again occupy the entire huge stage and has planned an outstanding display. The present indications are that the exhibit will be up to expectations in displays which should be of vital interest to all gas industry members.

Entertainment Committee Appointed

A. J. Gonnoud

President Boothby has announced the appointment of a carefully selected Entertainment Committee with A. J. Gonnoud, president of the Kings County Lighting Company of Brooklyn as chairman, and the following members: Bernard T. Franck, Milwaukee Gas Light Company; Raymond J. Vandergriff, The Laclede Gas Light Company; Earl Fisher, Pacific Public Service Company; Hudson D. Carmouche, Houston Pipe Line Company; Earl Smith, Atlantic City Gas Company; C. G. Young, Springfield Gas Light Company; O. H. Ritenour, Washington Gas Light Company; C. S. Stackpole, Consolidated Gas Electric Light and Power Company of Baltimore; C. E. Bartlett, Bartlett & Company, Inc.; W. G. Murfit, The Philadelphia Gas Works Company; W. S. Guitteau, American Meter Company; M. J. Harper, Rockwell Manufacturing Company; Louis R. Quad, Public Service Electric & Gas Company. Eugene D. Milener of the A. G. A. Headquarters Staff is the secretary of the Entertainment Committee. With that strong line-up it is anticipated the Entertainment Committee will provide an attractive and satisfactory recreational program.

Through the efforts of Earl Smith, president, Atlantic City Gas Company, and the cooperation of Charles G. Young, manager, Springfield (Mass.) Gas Light Company, arrangements have been made for Mr. Young to be the guest speaker at the Atlantic City Kiwanis Club, Thursday, October 10. Mr. Young will speak on the future of the gas industry. These arrangements are part of a plan to make the American Gas Association Convention really a gas week in Atlantic City.

LP Gas Plant and Distribution Practice

West Conshohocken plant produces LP gas-air mixtures with a minimum of equipment yet permits flexible operation both in quantity of gas produced and B.t.u. value

BY E. G. BOYER

Manager, Gas Department, Philadelphia Electric Co., Philadelphia, Pa.

E. G. Boyer

THE word "Practice" in the title of this paper is construed to mean "the methods of using liquefied petroleum gases, without any particular reference to the theory of LP-gas behavior." The subject will be treated generally, with particular reference to the actual "practice" developed at the West Conshohocken Plant of the Philadelphia Electric Company during the past winter.

As is well known in the gas industry, the constantly increasing cost of coal, and the rationing of oil and solid fuels during the war, and other factors have turned the interest of the public to the use of gas as the most desirable means of house heating. The demand for gas heating installations has risen considerably in the past few years.

To supply the increased load which house heating produces, many companies have gone to the use of LP gases as a very practical means of supplying peak load gas at comparatively small investment. It is estimated that in 1945 about 60,000,000 gallons of LP gases were distributed in undiluted form, or diluted to various heating values. This quantity was an increase of 25.6 per cent over that used in 1944.

The tendency seems to be towards more and more use of these fuels. The fact that butane is used in the production of gasoline tends to make it rather scarce in the wintertime, and therefore the trend is towards more propane and less butane. The trend toward a greater use of propane is expected to continue.

Distribution Practice

For peak-load shaving, the LP gas can be added either at the production plants or at some strategic point or points in the distribution system. The ideal place for adding LP gas to the distribution system is at or near the ends of the distribution mains. Adding the LP gas at these points saves transmission and distribution main capacity and investment and allows the normal base gas to be used closer to the production plants. Somewhat lower pumping pressures can be carried at the main plants because the base gas does not have to be pumped so far.

Usually, the LP gas supplied in this manner is 100 per cent interchangeable with the base gas, as when it is used to replace natural gas, so that during peak loads the LP gas can be fed into the mains in varying proportions up to entire replacement of the base gas without affecting the satisfactory performance of the customers' appliances.

However, LP gas-air mixtures are not always 100 per cent interchangeable with the gas normally supplied to the territory. This is the case of the Philadelphia Electric Company. In this event, for LP gas to augment the supply at peak periods means a plant equipped with some automatic mixing device so that the amount of LP gas fed into the system will not exceed a certain predetermined percentage of the normal gas. The determination of this percentage requires much study and much experimentation and is not something that can be done haphazardly.

These outlying "peak load" plants are required to function only when heavy load conditions demand, and this may be at any time during the day or night. They may operate a number of times each day, or they may not operate once in a week. Therefore, for reasons of economy, it is not always possible or feasible to have these plants attended; so, wherever possible, they should be fully automatic, and as simple as possible.

The simplest plant is that one which

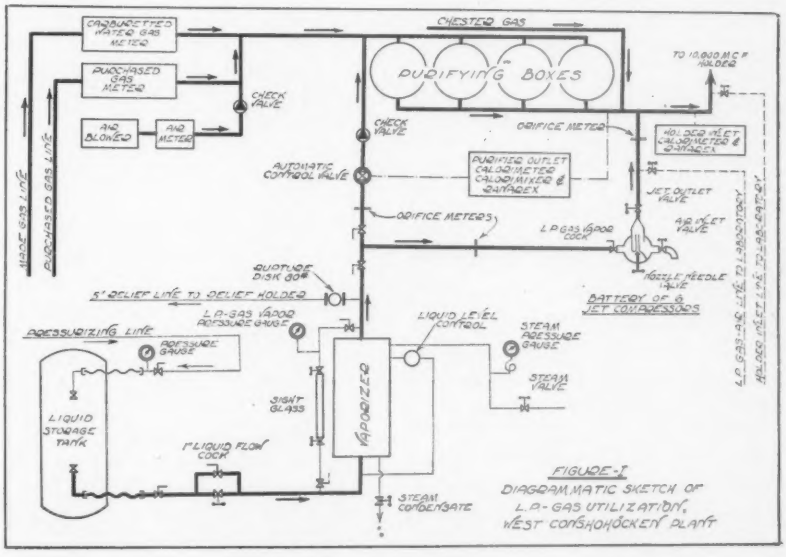


FIGURE-1
DIAGRAMMATIC SKETCH OF L.P.-GAS UTILIZATION, WEST CONSHOHOCKEN PLANT

Presented at A. G. A. Joint Gas Production and Chemical Committee Conference, New York, N. Y., June 3-5, 1946.

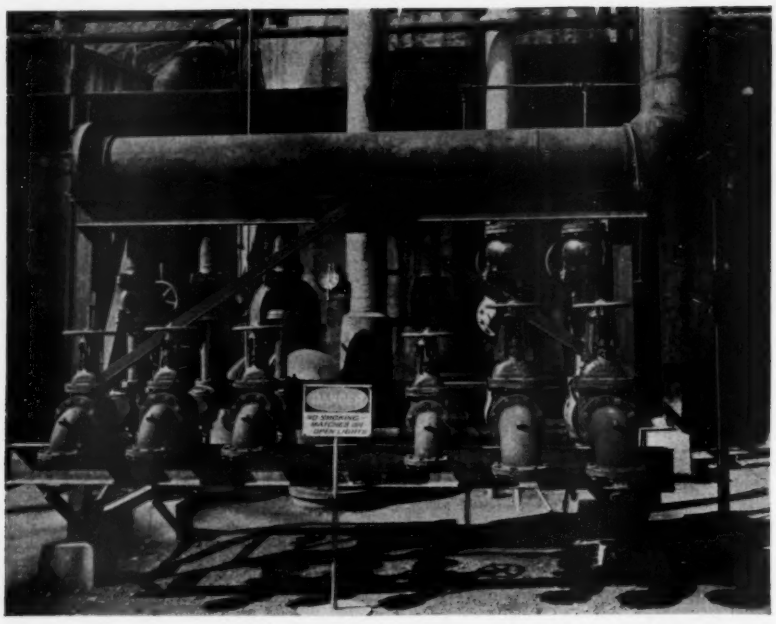


Fig. II. Battery of "jet compressors" where LP gas is mixed with air

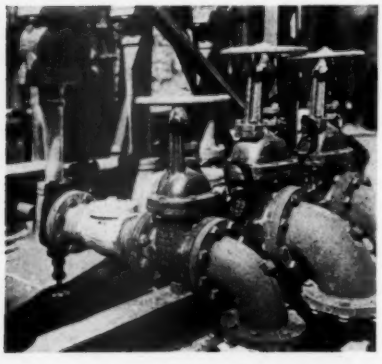


Fig. III. Closeup view of 4" jet compressor

supplies undiluted LP gas. When the conditions require the LP gas to be mixed with air, the problem becomes more involved; and when the conditions require that LP gas-air must be mixed only in definite proportions with the base gas, the problem becomes complicated. Of course, there are systems of controls which will operate satisfactorily, and do their job; but all automatic equipment is subject to failure, and the more automatic equipment there is the more likelihood there is of failure. A failure of automatic mixing equipment in an unattended plant can cause much distribution trouble and customer dissatisfaction. Especially is this true where the LP gas or LP gas-air mixture is not 100 per cent interchangeable with the base gas, where, for example, the equipment might fail and supply 100 per cent LP gas-air into a system where only 25 per cent is permitted.

Assume that LP gas is to be added to the entire gas sendout at the main production plant in varying amounts up to the maximum percentage allowed. Thus, if this gas, which has LP gas in it, reaches the territory where an outlying peak load plant is located, and in which the equipment is set to deliver LP gas in a certain percentage of the gas coming into the plant, the operation of that control equipment to its maximum production will give a street gas which contains much more LP gas than it should, and the customers will receive unsatisfactory service.

Therefore, considering the various factors which enter into the operation of an outlying LP gas plant to augment peak load supplies, it is my opinion that unless the LP gas supplied by that outlying plant is 100 per cent interchangeable with the normal gas, the entire addition of LP gas should take place at the main production plant.

This problem has concerned the Philadelphia Electric Company because the estimates for the gas to be sent out to our customers during the next five years show that in 1950 there will be a 66 per cent increase over what was sent out in 1945, principally because our residential space heating sales will be increased by 221 per cent, in addition to other normal increases. This also means that the gas to be produced at one of our plants will be 3829 per cent of that produced there in 1945, and on the maximum day the total gas produced and purchased will increase 296 per cent, or 68,700 MCF. All of this increase must be supplied by new production facilities. This means a large plant, and we are proceeding with an economic study for its future location, equipment and erection.

The base load gas will be supplied by standard, proven methods of gas production. For the most part, all gas needed over and above this base will be furnished by LP gas in diluted or undiluted form, as the case may require. It is estimated that on the maximum day of 1950 this will amount to about 39,750 MCF of LP gas-air. This figure does not include the LP gas that will be used for cold enriching, or for reforming in our sets. This, too, will be a sizeable quantity.

The use of LP gas to bolster weak spots in distribution systems has been time tested by many companies and has its definite advantages when used correctly. I can only say that each company must study its own problem and arrive at the best solution for its own case. For the case of the Philadelphia Electric Company, we have concluded that for the next five years at least, LP gases will serve us best at our main production plants.

Production Plant Practice

The usage of LP gases at principal production plants is advantageous because usually at those plants there is:

(a) Adequate labor for handling the LP gas and unloading it from tank cars or trucks into storage.

(b) Adequate and competent personnel to keep close watch on the operation of the controls and safety devices, and to make instant correction to any part which is not functioning correctly.

(c) Competent personnel to watch the performance of the gas in the test burners and to note instantly any tendency toward unsatisfactory appliance performance.

(d) Another advantage of using LP gas at the plant for enriching has the effect of

increasing the capacity of the transmission and distribution main systems. To interchange correctly with the normal gas, a gas, having a specific gravity higher than that of the normal gas, must also have a B.t.u. content higher than that of the normal gas in order to offset the effect of that higher specific gravity. These higher B.t.u.'s require fewer cubic feet of gas to be sent out to supply the same total B.t.u. to the customers, and the effect is to increase the effective capacity of the transmission and distribution system. In many instances this is a very definite advantage on peak days.

In general, LP gases can be used to advantage in production plants in three main ways:

(a) Reforming them in standard water gas machines by passing them through the hot fuel bed.

No time will be spent here in describing anything technical about the use of LP gases by such methods, but for those desiring the theory and operation I can suggest reference to my paper given before the New England Gas Association in June 1945 entitled, "The Utilization of Hydrocarbon Gases in the Production and Distribution of Manufactured Gas." It is sufficient to say that this method of using LP gases has proven perfectly satisfactory.

(b) Using undiluted LP gases for cold enriching to any desired B.t.u., any other gas that is deficient in B.t.u.

(c) For the production of LP gas-air mixtures, primarily for the purpose of increasing the production capacity of the main plant.

25,000 Gallons Per Day

The last two methods, and particularly (c) are the more common ways of using LP gases. They are the two methods now in use at our West Conshohocken Plant and which eventually will be installed in our Chester Plant.

For the next winter for base load operation, we are planning to use at the West Conshohocken Gas Plant an average quantity of about 25,000 gallons of LP gas per day. This will be used in a reforming apparatus on the carburetted water gas sets, for cold enriching of manufactured gas and purchased gas, and for the production of LP gas-air mixtures to increase the production capacity of the plant; and on maximum days we may use as much as 95,000 gallons of LP gas per day. This is nearly the capacity of ten standard tank cars.

The storage capacity is planned to be 150,000 gallons which may be increased to 200,000 gallons to insure adequate reserve capacity for the loads that are anticipated. The tanks are "propane" tanks and are suitable for storing whatever LP gas is available from the refineries during the winter.

LP Gas Installation at West Conshohocken Plant

During this past winter an LP gas installation was made at our West Conshohocken Plant. Figure I is a diagrammatic sketch of the system. At the present time the system is entirely manually controlled, but it will be fully automatic after the necessary equipment has been received and installed. Some of this equipment is shown on the sketch.

The LP gas is received in tank cars and is unloaded into the storage tanks shown at the lower left hand corner of Figure I. From the tank the liquid is forced, under pressure, to the vaporizer where steam is admitted and the LP gas is vaporized to about 45 pounds per square inch gauge pressure. From the vaporizer the LP vapor can be used in either or both of the following jobs:

(a) *Cold Enriching*—The bulk of our gas at West Conshohocken is purchased coke oven gas, and its flow is shown on the diagram as the "Purchased Gas Line" at the upper left-hand corner of Figure I, and shows the gas passing through the purchased gas meter. This gas as received is at about 530 B.t.u.,

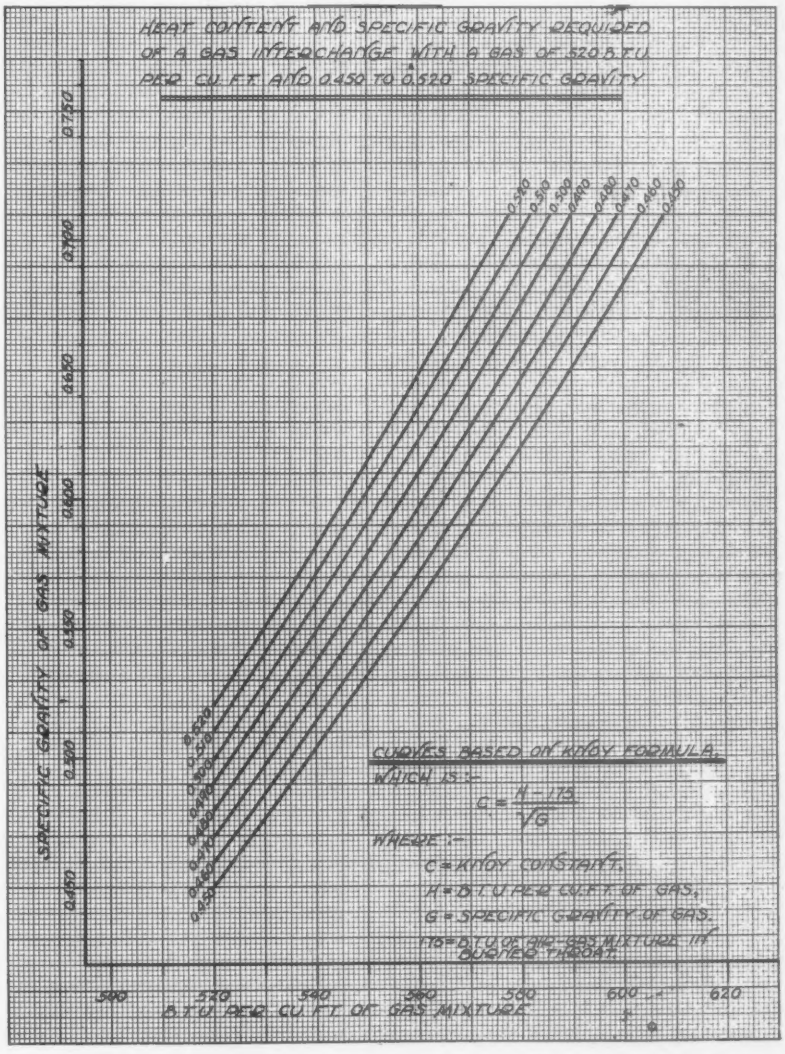


Fig. IV. Reproduction of curves used in operation at West Conshohocken plant

and to bring this down to 520 (which is our standard distribution requirement), air is added from the blowers, and passes through the air meter and joins the purchased gas flow. Until this LP gas was available, very little air could be added before the final B.t.u. of the mixture was reduced to 520. With this LP gas available, much more air is added for the purpose of aiding our dry box purification, and instead of the previous one or two per cent of air, we are able to add from six to nine per cent air. Of course this much air lowers the B.t.u.'s below the 520 B.t.u. standard, so the gas is enriched back to 520 with the LP gas. This system has been in continuous operation now for about six weeks and is working very satisfactorily.

At the present time the controlling of the mixture is done manually because the Calorimixer has not yet been installed. A calorimeter is being used to show the results of the manual operation. Eventually the control will be by the Cutler-Hammer calorimeter and Calorimixer and the automatic control valve; all of which are shown in Figure I, just below the "purifying boxes."

At the same time, the LP gas can be used for enriching the gas made on the water gas machines. The made gas from exhauster flows through the "made gas line," then through the meter, and joins the flow of the combined purchased gas and air diluent to the boxes. The combined flow is enriched to the desired B.t.u. by the same connection mentioned for the purchased gas enrichment.

(b) *Production of LP Gas-Air Mixtures*—The other way in which the LP gas is used is for the production of LP gas-air mixtures of various B.t.u.'s. This system is shown at the right center of the sketch. Figure I shows how the liquid LP gas flows to the vaporizer, where it is vaporized at a pressure of 45 pounds per square inch. The vapor goes to the "jet compressors" where it is mixed with air in the required proportion, and enters the stream of other gases going to the storage holder.

Figure II is a picture of the battery of these "jet compressors" showing the four four-inch jets, with a capacity of 25 MCF per hour each, and the two six-inch jets, with a capacity of 60 MCF per hour each, giving a total capacity of 220 MCF per hour, or over 5,000 MCF per day for the entire battery at about 600 B.t.u. per cubic foot of LP gas-air mixture.

This summer there will be added one eight-inch jet and one ten-inch jet, which will raise the capacity of the battery to about 12,000 MCF per day. Figure II shows the simplicity of this large capacity installation. On this Figure II, "A" is the LP gas vapor line from the vaporizer, and "B" is the 16-inch outlet header from the jet compressors. The I-beam supporting structure hides the connections of the respective jet outlet pipes into this header.

Figure III is a close-up view of one of the four-inch jet compressors, and shows its simplicity. "A" is the body of the jet compressor, and holds the LP gas nozzle. A diagrammatic section of this body is shown at the right center of Figure I.

The operation of the jet compressor is as follows:

The LP gas vapor flows through the vapor cock "B" at about 45 psi gauge pressure, and enters the bottom of the body "A" of the jet compressor. The nozzle adjusting valve "F" is kept wide open to allow the passage of the maximum amount of LP gas, which is forced through the nozzle into the venturi out-

TABLE I

OPERATION AT THE WEST CONSHOHOCKEN GAS PLANT, USING LP GAS FOR ENRICHING AND PRODUCING GAS-AIR MIXTURES, ON DAYS WITH NORMAL AND CURTAILED FLOWS OF PURCHASED COKE OVEN GAS

					LP Gas		Total Gas				
Line	*Date*	*Purchased Gas MCF*	*Diluent Added MCF*	*Reformed Oil Gas from Chester MCF*	*Cold Enriching MCF*	*LP Gas-Air (at B.t.u. shown in Col. 10) MCF*	*To Storage Holder MCF*	*B.t.u.*	*Specific Gravity*	*Curve of Interchange on Fig. IV*	*LP Gas-Air B.t.u. Produced*
1	Column No.	1	2	3	4	5	6	7	8	9	10
2	*A—Operation with Purchased Coke Oven Gas at Normal Rate*										
3	Feb. 11, 1946										
4	Total	17,628	297	2,500	—	2,400	22,825	548	0.531	0.450	795 (a)
5	% of Total	77.2%	1.3%	11.0%	—	10.5%	100.0%				
6	Feb. 12, 1946										
7	Total	17,970	265	1,596	—	2,400	22,231	552	0.535	0.450	805 (a)
8	% of Total	80.8%	1.2%	7.2%	—	10.8%	100.0%				
9	Feb. 13, 1946										
10	Total	18,597	316	1,442	—	2,175	22,530	538	0.512	0.460	637 (a)
11	% of Total	82.5%	1.4%	6.4%	—	9.7%	100.0%				
12	Note (a)—B.t.u. of Column 7 controlled by varying the B.t.u. of the LP Gas-Air produced on the Jet Compressors.										
13	*B—Curtailed Purchased Coke Oven Gas*										
14	May 8, 1946										
15	Total	6,472	442	7,863	385	375	15,537	577	0.646	0.480	600 (b)
16	% of Total	41.7%	2.8%	50.6%	2.5%	2.4%	100.0%				
17	May 9, 1946										
18	Total	5,473	396	7,371	365	600	14,205	580	0.655	0.480	600 (b)
19	% of Total	38.5%	2.8%	51.9%	2.6%	4.2%	100.0%				
20	May 10, 1946										
21	Total	4,629	366	7,110	368	600	13,073	588	0.671	0.470	600 (b)
22	% of Total	35.4%	2.8%	54.4%	2.8%	4.6%	100.0%				
23	May 11, 1946										
24	Total	4,697	311	4,142	234	592	9,976	580	0.647	0.470	600 (b)
25	% of Total	47.2%	3.1%	41.5%	2.3%	5.9%	100.0%				
26	May 12, 1946										
27	Total	4,878	319	4,153	245	600	10,195	579	0.644	0.470	600 (b)
28	% of Total	47.9%	3.1%	40.7%	2.4%	5.9%	100.0%				
29	Note (b) B.t.u. of Column 7 controlled by the enriching LP Gas. The B.t.u. of the LP Gas-Air were set and kept approximately constant.										

let throat "C." As the LP gas enters the throat at high velocity, it creates a suction in the throat sufficient to suck air in through the air inlet elbow and valve "D," and through the horizontal check valve "E." The air and LP gas are mixed in the venturi throat "C," and pass through the jet outlet valve "G" into the 16-inch collecting header at a pressure of 10-15 inches of water column, and pass to the storage holder. The check valve "E" is installed so that it will close under any back pressure in the jet compressor and prevent the escape of holder inlet gas to the outside air.

The picture shows the air inlet valve "D" as being shut. During operation, it is usually wide open to permit the inspiration of the maximum volume of air. However, when desired, the valve is throttled to decrease the inspiration of air to produce a mixture of higher B.t.u. content.

Other LP Gas Plant Practice

That is the Philadelphia Electric Company installation at the West Conshohocken Plant. Other companies have installed different systems. For instance, one company has a capacity of 10,000 MCF per day of butane-air gas. Butane is vaporized at 70 psi pressure; compressed air is supplied at 45 psi pressure. The two flow to a mixer through a regulator at 35 psi pressure and a ratio of 47 per cent butane and 53 per cent air.

Another company has a propane-air capacity of 6,850 MCF per day. This plant has 100,000 gallons liquid storage capacity, two air compressors, heat exchangers, etc., and a calorimeter and ratio controller for mixing the propane and air.

Another plant mixes propane with coke oven gas to produce a 1040 B.t.u. mixture at 0.68 specific gravity. A Cutler-Hammer Calorimixer is used for mixing the propane and coke oven gas.

Another company mixes butane and air with air inspirators, which discharge the mixture at about 5 psi pressure. This mixture is at 1650 B.t.u. per cubic foot and a specific gravity of 1.50, and is used as a substitute for 1100 B.t.u., 0.60 specific gravity natural gas.

Another company produces butane-air gas by means of a ratio controller connected across orifices in the compressed air and butane-air mixture lines, which actuates a motor valve in the butane vapor line to insure a constant butane to air ratio.

Another plant uses propane to enrich to 825 B.t.u. an oil gas produced at about 430 B.t.u. This mixture is added to natural gas and refinery gas for peak load control.

These examples give some idea of how practices vary among companies in the use of LP gases to suit individual cases.

Operating Practice

In the Philadelphia Electric Company system the customers' appliances are adjusted for two different specific gravities. Approximately half the territory receives what we call "high gravity gas," which is a reformed refinery oil gas with a specific gravity of 0.70. The other half of our territory receives what we call "low gravity gas," which has a specific gravity of about 0.450, or less. This "low gravity" area is the territory supplied by the West Conshohocken Plant and is low gravity because practically all the gas is purchased coke oven gas. It is into this low gravity area that the mixed gas containing LP gas is supplied.

On days when a large sendout is required the final street gas may be a mixture of quite a number of separate gases, and may include purchased coke oven gas, carburetted water gas, reformed refinery oil gas, and LP gas-air mixtures or undiluted LP gas vapor. There is no way of controlling exactly the per cent of each of the possible gases in the final gas. The mixture is more or less variable, depending upon general conditions of the entire system, which govern how much of each gas is taken into the plant or produced on the plant's own sets at various times of the day.

This constantly varying mixture makes it difficult, if not impossible, to arrive at the correct percentages of each gas to give satisfactory interchangeability in the customers' appliances. If it were possible to supply just coke oven gas and LP gas-air mixtures the maximum percentage of LP gas-air that could be added could be definitely determined, but when there are so many gases constantly changing in proportion it is almost a physical impossibility to follow any predetermined curve of allowable percentages of each gas.

Much work has been done by the industry on studying the factors that make for good interchangeability of a substitute gas for the base gas. The American Gas Association Mixed Gas Research Committee has done excellent

Fig. V. Laboratory setup showing appliance burners used to check performance

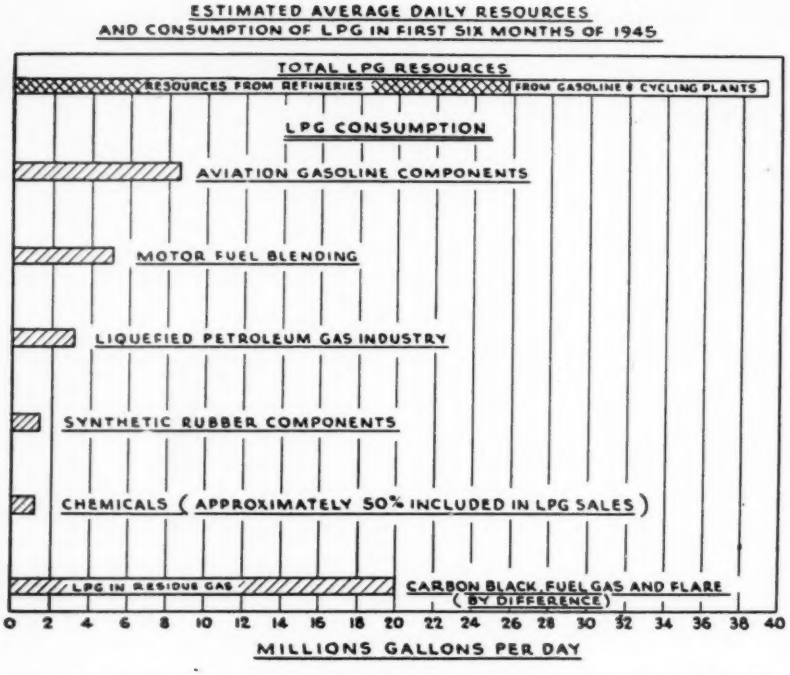

ESTIMATED AVERAGE DAILY RESOURCES
AND CONSUMPTION OF LPG IN FIRST SIX MONTHS OF 1945
TOTAL LPG RESOURCES
RESOURCES FROM REFINERIES
FROM GASOLINE & CYCLING PLANTS
LPG CONSUMPTION
AVIATION GASOLINE COMPONENTS
MOTOR FUEL BLENDING
LIQUEFIED PETROLEUM GAS INDUSTRY
SYNTHETIC RUBBER COMPONENTS
CHEMICALS (APPROXIMATELY 50% INCLUDED IN LPG SALES)
LPG IN RESIDUE GAS
CARBON BLACK, FUEL GAS AND FLARE
(BY DIFFERENCE)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
MILLIONS GALLONS PER DAY

Chart showing production and consumption of liquefied petroleum gases for the first half of 1945 (From paper by G. G. Oberfell and R. W. Thomas, presented at annual meeting of Liquefied Petroleum Gas Association at Colorado Springs, Colorado)

work in devising formulas for the calculation of proper interchangeability limits of one gas with another, and the results of this research have been published in various A. G. A. bulletins. The formulas entail much calculation, and are rather cumbersome to handle in the day-to-day operation of the gas plant. Their application depends upon having complete analysis of the various gases, and not all gas plants are equipped with either the apparatus or the manpower to make continuous analyses of gas samples. It is my opinion that the A. G. A. formulas are excellent for a study of all phases of interchangeability and for the laying of plans for future operation and economies, but after having worked with this problem for the past heating season I believe the A. G. A. formula is too cumbersome for actual day-to-day operation, or for more than an occasional check.

Therefore something more easily applied to day-to-day operation had to be found, and the formula devised by Mr. Knoy has been found very practical for guiding the operation at our West Conshohocken Gas Plant.

Mr. Knoy's formula is $C = \frac{H - 175}{G^{\frac{1}{2}}}$,

in which H is the B.t.u. per cubic foot of the gas, G is its specific gravity, and C is a constant. This formula states that if two gases are to be interchangeable they must have the same value of C; so, if the specific gravity increases, the B.t.u.'s of the gas must increase so that C remains constant.

Figure IV is a reproduction of the curves used in actual operation at our West Conshohocken Gas Plant. The numbers shown at the ends of each curve represent the specific gravity for which the appliances in the territory are assumed to be adjusted when the gas is at the standard of 520 B.t.u. per cubic foot. The gas replacing the standard gas must satisfy the conditions as shown by these curves.

According to the Knoy formula, the ratio between the heating value and the square root of the specific gravity of a particular gas is always a constant and any gas replacing it must have the same value of constant. The curves are plotted from theoretical calculations so that each point on any one curve satisfies the Knoy equation for the respective base gas.

In the practical application of these curves, the B.t.u. of the total mixture of all gases going to the storage holder is determined and controlled in the following manner:

At the inlet to the 10,000 MCF holder are a calorimeter and a specific gravity recorder. The specific gravity of the mixture is used as the basis for any adjustments necessary to effect the correct relationships between the final B.t.u.'s and specific gravity; the calorimeter records the B.t.u. of the gas mixture entering the holder.

The gas entering the holder contains varying quantities of base coke oven gas, carburetted water gas, reformed refinery oil gas, and LP gas-air. For this reason the specific gravity of the mixture is practically uncontrollable, and control is possible only over the B.t.u. This control is obtained in either of two ways:

(A) Control on the "jet compressors" is obtained by making a richer or leaner mixture of LP gas-air according to the B.t.u. requirements.

The steps in this operation are as follows:

1. Read the actual specific gravity on the recorder.
2. Refer to the chart (Figure IV).
   (a) On the left-hand scale, read the observed specific gravity.
   (b) Project this point to the right until it intersects the 0.450 line.
   (c) Project this point to the base scale, and read the number of B.t.u. the gas mixture should contain.
3. Make the necessary B.t.u. corrections by changing the B.t.u. of the butane-air mixture being produced by the "jet compressors." As stated before, this change is made by changing the setting of the air inlet valve.
4. Observe the effect of the adjustment as it is recorded by the Calorimeter.
5. Repeat the procedure until the desired B.t.u.'s are obtained.

(B) The other method of control is to set the jet compressors for a definite B.t.u. mixture of say 600 B.t.u., which gives a large production of LP gas-air, and controlling the interchangeability B.t.u. by means of the enriching connection to the purchased gas and manufactured gas lines (see Figure I). Control is still obtained from the reading of the calorimeter and the specific gravity recording instrument at the inlet to the 10,000 MCF holder.

In order to keep a watch on the performance of the gas, laboratory control is used as well as the practical application of the Knoy curve. Figure V is a picture of the laboratory set up showing the various *(Continued on page 359)*

Moisture Problem in Housing

A. G. A. domestic gas research projects on humidity control and venting of gas heaters aims at small-home problems

BY E. C. ADAMS

Chairman, Technical Advisory Group for Direct Gas Space Heating and President, Adams Bros. Manufacturing Co., Pittsburgh, Pa.*

E. C. Adams

THE problems that come with excess moisture in dwellings cannot all be solved by technical men. They involve many phases of the business of gas service. My viewpoint of the research problems is strictly from the business management point of observation. I am not qualified as a research technician, and my discussion of the problems will not be characterized by the exactness that must be followed in publications about research work. The research work has not progressed far enough to publish findings, but some general information about the problems at this time may be quite useful to you.

For example, you may hear one of these days that a prominent builder is advising against the use of gas in the dwellings he is building. You may think he is unduly influenced by commercial interests of a competing service. That, of course, may be a factor, but probably a greater factor will be the builder's fear of damage from water vapor formed by gas combustion.

Why should a builder advise against the use of gas when we all know how eminently satisfactory are modern gas appliances when they are properly used? To answer that question, I'll have to lead you through a somewhat devious course.

Most gas men feel that when gas water heaters and gas heating equipment are connected with flues and when ventilating fans are provided in kitchens, that the average house will not have any excess moisture problems. That is true of most of the older houses. But with the rapid growth of the use of insulation and weather proofing methods of building, which have been promoted by claims that they will be paid for out of savings in fuel costs, the public has become thoroughly sold on the idea that it is proper to keep down the entry of outside air in cold periods to the lowest possible minimum.

As a consequence of these trends, moisture conditions within dwellings have tended to become critical in many cases where the causes of excessive moisture are not readily determined or easy to explain. These cases have developed in the class of houses that have been built during the past ten years.

Trend Toward Compact Housing

Now we are coming into a period where a large volume of small and very tight houses are to be built. Experience has proved that the moisture accumulations in these small tight houses are far greater than we are accustomed to dealing with. Those who have studied the subject think that the problems involved in these moisture conditions will be of vital importance to the gas industry.

Regardless of what your position is in the industry, you will at times be involved in discussions about modern housing. I think you will find the subject more interesting if you have some understanding of moisture problems in homes. For example, you will hear much about vapor seals in connection with modern housing. It will be useful to you to know the function of vapor seal construction and the reasons for its widespread use in modern housing.

Water vapors have variable pressures when they are carried along in the air: The pressures of water vapors vary with their temperatures and percentage of saturation. Thus the vapor pressure inside a heated dwelling is greater than the vapor pressure outside.

Vapor must be considered as a substance independent of the air which holds it in suspension. Vapor will move from one place to another without movement of the air with which it is mixed. It moves by reason of vapor pressure. Some portion of the vapor in a dwelling will move in a direction contra to the movement of the air which holds it in suspension. For example, the vapor pressure in a column of moving gases and air in a chimney exerts pressure on the walls of the chimney. It will go through the porous brick and mortar of an unlined chimney. In a dwelling where the vapor saturation is critical, much concealed damage can occur. If a clothes closet is cold, mildew will form and damage stored clothing. The interior spaces of window frames will contain frost and even blocks of ice if the cold is severe and continued long enough. Vapor will readily go through any porous material such as plaster, or common brick, or unglazed tile. These are characteristics of vapors which are not usually considered in our normal work. They become important to us when water vapor interferes with the satisfactory service of gas, and public acceptance of gas as the most desirable domestic fuel.

Insulation Affects Circulation

In ordinary veneer wall construction there is an air space. If the air in the wall spaces can circulate to some extent, it usually is sufficiently dry to pick up water vapor as it emerges from the plaster side of the wall and to carry it to the outside air. No damage results in such a process.

But with the widespread use of insulation packed in the spaces of walls, there is practically no circulation of air. The water vapor passing through the wall from the inside to the outside condenses when it hits the cold outer shell of the wall, and forms frost. If the cold period is prolonged this frost can build up and eventually may cause condensing conditions on the interior surfaces of a heated dwelling. When this happens considerable damage occurs inside the wall and inside the dwelling.

To eliminate this possible condition, it is common practice now to provide a

Presented at Pennsylvania Gas Association's Annual Meeting, May 22, 1946.

* An advisory group of the A. G. A. Committee on Domestic Gas Research.

membrane barrier of vapor proof material on the inner shell of walls to prevent the passage of water vapor from the warm side of walls or ceilings to the cold exterior side.

With this practice in general use, we are now faced with the need to take care of a higher saturation of moisture, because vapor barriers eliminate outlets for water vapor we formerly had through walls and ceilings.

Then we have the reduction in size of the air space within houses without a corresponding reduction in the causes of moisture. In an ordinary dwelling moisture comes from many sources.

In new houses there usually is much moisture in the building materials which do not thoroughly dry for a considerable time. Moisture is released in cooking operations. The family washing and particularly the indoor drying of the family washing is a major source of moisture. Bathing and the ordinary functions of washing hands and faces causes water vapor to be released. The washing of floors releases sizable quantities of water vapor. Even breathing releases much water vapor as you will realize when you recall how quickly the indoors of your auto gets covered with condensed water vapor in cold weather.

Unless water vapor is discharged to the outside air it builds up inside the house, and it will condense more readily as the air becomes laden with a greater saturation of water vapor.

We are normally accustomed to about five air changes an hour in the average house. In many of the new houses as they are being built the air changes will be about one per hour or less. This is a most important factor in causing moisture conditions which can be extremely destructive.

To summarize the conditions I have mentioned up to now, and which have nothing to do with gas, we have

1. Much less infiltration, which means that we will have less dry air to dilute the water vapor laden inside air and thus aid in holding the water vapor content below the condensing point.

2. We have less air space within modern houses without a corresponding decrease in sources of water vapor which means that the air within these houses will have to carry a greater load of water vapor and thus make condensing conditions more likely to occur.

3. We have vapor seals, which means that we now have to contend with additional vapor that normally moved to the outside air through walls, ceilings, and roofs.

That such conditions can be a source of major damage and extremely annoying was forcibly illustrated at the recent Cleveland meetings by the showing of moving pictures films picturing damaging conditions in modern houses. I regret that we do not have this film available for this meeting. It was used at the research meeting in Los Angeles just a few days ago.

The picture showed pools of water around baseboards, on floors, and water trickling down walls. It showed extensive mould growth in many places where the air circulation was sluggish such as back of cabinets, in corners, and in closets. It showed warped floors that interfered with doors opening. It showed warped roofs. It showed extensive damage to painted surfaces.

This film was not prepared particularly for our research work. It was prepared in connection with other research work on housing being conducted by a member of the Purdue Research Staff.

In none of the cases photographed was gas heating used. Nor have we up till now cited any part that gas combustion may have in causing excessive moisture conditions. If we were in the free discussion period I would expect someone to ask me to come to the point and explain why we should be vitally interested in problems that properly belong to the building trades. I'll try to do just that.

Since it is well known that the combustion of 1,000 cu. ft. of natural gas or 2,000 cu. ft. of manufactured gas forms about 11 gallons of water in vapor form, builders are afraid of the damage that may result from the use of gas in their houses even though appliances are vented. Some of them are advising against the use of gas. Experience has shown that in many tight houses, the operation of an exhaust fan will cause negative pressure. When this occurs, it is probable that some spillage will occur at draft diverters of gas appliances. Consequently, it is quite possible that if gas appliances are not installed with facilities to insure that they will operate as they are designed to operate, they can be a factor in causing excessive moisture conditions.

Because many of the public and a large percentage of builders think of gas heating as "wet heat" you may be sure that if gas heating is used it will be the first to be *(Continued on page 358)*

Have You Grown Up?

● Two University of Pennsylvania psychiatrists have recently defined maturity in terms of abilities which, if attained by enough people, could ensure the continuity and continued development of the race along the lines of its inherent destiny without wars.

Maturity is a quality of personality that is made up of a number of elements. It is the stick-to-itive-ness, the ability to stick to the job, or until one has given all one has in the endeavor. It is the quality or capacity of giving more than is asked or required in a given situation. It is this characteristic that enables others to count on one; thus it is reliability.

Persistence is an aspect of maturity; persistence to carry out a goal in the face of difficulties. Endurance of difficulties, unpleasantness, discomfort, frustration, hardship. The ability to size up things, make decisions, is a characteristic of maturity.

This implies a considerable amount of independence. Maturity includes determination, a will to achieve and succeed, a will to life.

Of course, maturity represents the capacity to co-operate; to work with others, to work in an organization and under authorities under new authority. The mature person is flexible, can defer to time, persons, circumstances. He can show tolerance, he can be patient, and above all he has the qualities of adaptability and compromise.

Maturity represents a wholesome amalgamation of two things: First, dissatisfaction with the status quo, which calls forth aggressive, constructive effort, and second, social concern and devotion. It is the moral in the individual.

Time is at hand for everybody to accept the new routine, the change in management, the accelerated pace that makes men out of boys and women out of girls. Time is at hand to use your persistence as an aspect of maturity.

—*Gas Service*

Program for Training Servicemen

A plan for training appliance mechanics that provides a sound foundation of fundamental knowledge and assures continued development of the individual on the job

BY C. C. WESTMORELAND

Southern California Gas Co., Los Angeles, California

C. C. Westmoreland

THE fundamental concept of training which governs the activities of the Customer Service Training Group of the Southern California Gas Company is identical with that of other companies who have formalized a course of training to familiarize employees with the numerous job duties of the appliance mechanic. The general procedure of combining field and classroom instruction, usually followed by the industry, is the basic pattern followed by our group, the only difference being the distribution of time between classroom and field instruction.

Originally, field training occupied the predominant role and constituted more than 90 per cent of the training time. That figure has been revised through successive steps which decreased the percentage of time devoted to field training and increased the classroom training period. At present field training constitutes approximately 13 per cent of the training period and classroom training makes up the remaining 87 per cent.

It is felt that the above revision is the principal factor which has made it possible to reduce the over-all training time approximately 60 per cent. The determining factor deciding the amount of training that can be effectively done in classrooms is the equipment available for use by the training group.

Facilities and Equipment

The amount of equipment required to administer a training course will vary widely with different companies. Company organization, service policy, labor turnover, and geographic distribution of properties are some of the major variables influencing the organization of a training course, which in turn will determine the selection of facilities and equipment. The problems of each company are different and no ready-made training program will fit all situations.

The principal advantage gained from the extensive use of training equipment lies in the fact that a greater part of the course can be conducted in the classroom, which provides for closer control of training routines. Such control makes it possible to assure adequate coverage of subjects in a uniform manner planned for ease of learning, which in turn reduces the training period. Comparatively little equipment need not be regarded as an insurmountable limitation in conducing a training course. It will probably mean, however, that considerably more time will be required to obtain acceptable results.

The physical plant occupied by the Customer Service Training Department of the Southern California Gas Company occupies 7,500 square feet. Housed in this area are 86 representative appliances, 56 operative manipulation boards, and 232 cutaway controls. Specific information regarding the space and equipment related to various activities is tabulated in Figure 1. With few exceptions the names of the above facilities indicate their use in the training course. The Forms and Procedure room is an area partitioned into two sections containing a model kitchen, a range, an automatic water heater, a refrigerator, and two space heaters connected to one meter.

Students receive training related to the various appliances in classrooms equipped to cover a specific subject. Near the end of the course the Forms and Procedure room is used for training intended to consolidate the points treated earlier into procedures involving meters, appliances, and clerical forms, which will result in the completion of the various types of work assignments. Sample orders, such as Turn-Ons, Closes, Periodic Meter Changes, and High Bill Investigations, are practiced for several days in an effort to develop fundamental routines which will be helpful in executing assignments in the field. The shop equipped with a few power tools and numerous hand tools is used to fabricate the training "props" used in the courses.

The selection of appliances in most cases was based on the frequency with which they are encountered by servicemen in the field. "Problem" appliances of questionable design requiring extremely precise adjustments are useful for advanced instruction but should not be used extensively in training new people. That point was clearly demonstrated in our early experiences with classroom training. At one time all the portable space heaters in the heating room were old, poorly designed trouble-makers which had been used in refresher courses for experienced servicemen. When new people who had received that type of training were released to the field, they were inclined to be too critical of space heaters in general and re-

TRAINING FACILITIES AND EQUIPMENT

	SQ FT	NO. OF APPLIANCES	NO. OF MANIPULATION BOARDS	NO. OF CUTAWAY CONTROL
RANGE ROOM	621	10	14	89
WATER HEATER ROOM	580	14	28	85
REFRIGERATION ROOM	870	10	5	21
AUDITORIUM	1020	--	--	--
FORMS & PROCEDURE ROOM	850	6	--	--
HEATING ROOM	915	52	34	37
SHOP	356	--	--	--
METER & REGULATOR ROOM	792	10*	--	22**
OFFICE	1480	--	--	--
	7484	102	81	254

* OPERATIVE METER SETS
** CUTAWAY METERS AND REGULATORS

Figure 1

Presented at Pacific Coast Gas Association Utilization Conference, Technical Section, Sacramento, Calif., April 24-25.

luctant to attempt adjustments. A few modern pieces of equipment and a different approach by instructors has overcome that attitude to a considerable degree.

The term "manipulation board" was coined to identify equipment mounted in a manner which makes it possible for the controls to be adjusted and operated as though they were part of an appliance. A few examples of manipulation boards are shown in Figures 2, 3, 4, 5, 6, and 7.

Use of Manipulation Boards

This type of training aid was found to be exceptionally useful in a variety of ways. In many cases a manipulation board can be used as an inexpensive substitute for a complete appliance. Rapid understanding of the entire mechanism is possible because the relationship of the various parts is clearly evident. The students can apparently carry over the knowledge gained on manipulation boards to complete appliances with little difficulty. Since the boards are portable it is possible to set up a classroom in almost any location.

The value of cut-away exhibits as a means of covering construction details of controls has long been recognized and does not warrant extensive discussion at this time.

Less known but rapidly gaining popularity in our industry are the exploded type of drawings which are used in a manner comparable to cut-away controls. Figure 8 is an example of the exploded-type drawing. The value of this type of drawing in industry was conclusively proven during the war. It was found that marginal laborers were able to understand quickly and perform complex assembly operations with a minimum breaking-in period when exploded drawings were used for instruction purposes.

This technique is being treated in conjunction with cut-away exhibits because they both are used to explain obscure construction details of appliance accessories. The drawing is comparable to cut-away controls in effectiveness for most purposes and has distinct advantages for some types of application.

When there is a need for widespread distribution of information relating to a specific control which will be used for reference purposes in the field, the exploded drawing together with the printed instructions is usually the cheapest, quickest, and most effective method to use. Cross-section drawings are another means of accomplishing this purpose, but in my opinion they run a poor second and will eventually be considered obsolete as an instruction technique.

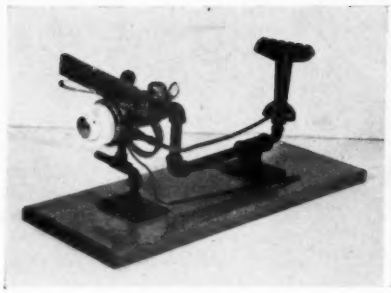


Fig. 2

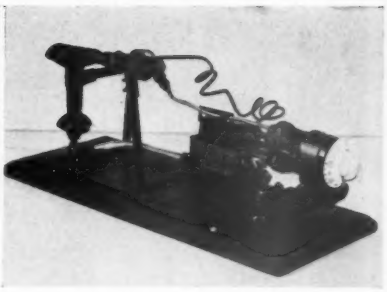


Fig. 3

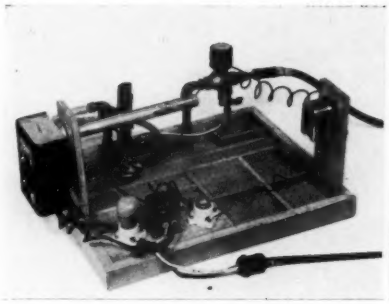


Fig. 4

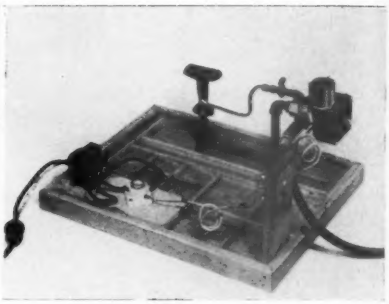


Fig. 5

Fig. 6

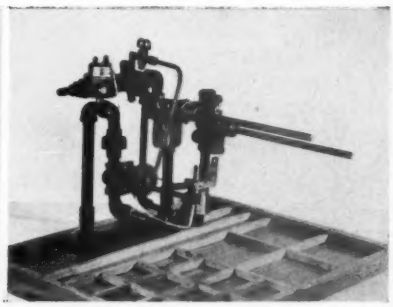


Fig. 7

Examples of manipulation boards used for training purposes

Personnel

Figure 9 shows the sections and individuals of the Customer Service Department involved in training activities. The upper part of the chart represents groups directly responsible to the Manager of Customer Service for specific functions. In addition, they contribute to the training program in the following manner:

Ordinance Section: Supplies information about municipal ordinances to the Training Department for inclusion in courses and for distribution to service personnel.

Standards Section: Time Study Analysts act as field instructors riding with students during the final stages of training. Specific methods for performing certain operations based on extensive time studies are obtained from the Standards Section for inclusion in training courses. Time studies conducted by this group are used as a basis for determining the amount of work that should be completed by newly trained employees.

Quality Control: Service inspectors

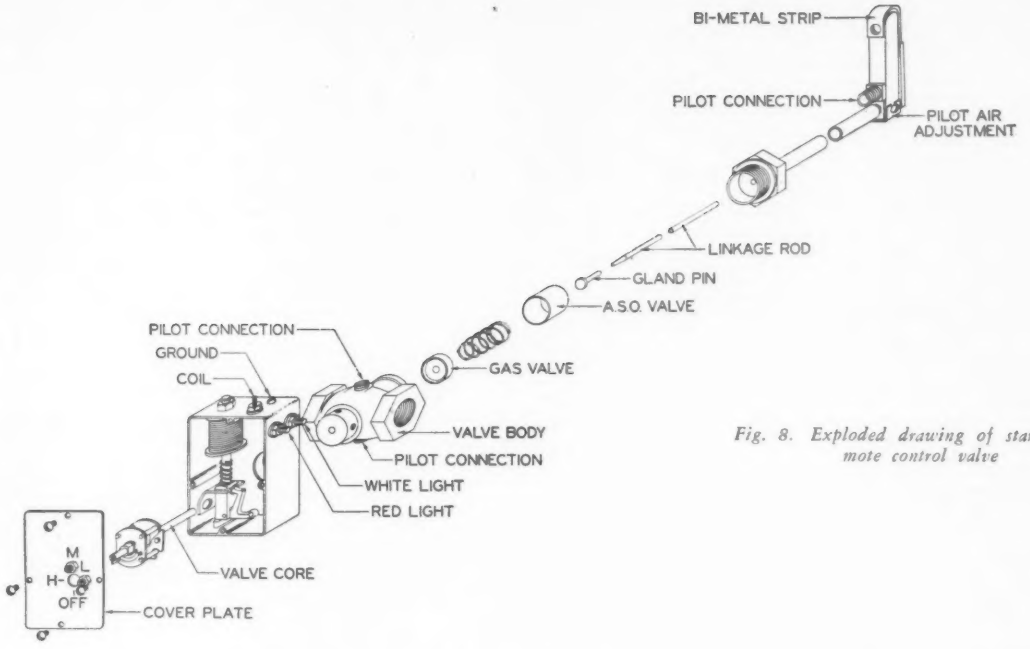


Fig. 8. Exploded drawing of standard remote control valve

act as field instructors by riding with students during the final stages of training. This group conducts field inspections of recently training employees' work and compiles monthly reports indicating the individual's progress on the job. Those reports are used in the training department for course revisions and for appraising the over-all effectiveness of the training program. Line supervisors use the reports to advise new employees of their status.

Utilization Engineer: Training problems involving engineering or design of equipment are referred to the Utilization Engineer's office. Advance information on new appliances is secured through a representative of the Utilization Engineer's Office and used for preparing mechanical bulletins for service personnel.

Operating Superintendents: Line supervisors reporting through Operating Superintendents conduct the final phase of field training. The observations of those men together with the training record of the students are the deciding factor determining whether or not the trainee meets the requirements of the job. Individual follow-up training is conducted by supervisors until the new student is considered fully competent to perform the work.

Dispatch Office: Dispatch offices throughout the system dispatch selected routes of work to the newly trained employee. Those routes are combined to include representative work which can be sampled by service inspectors of the Quality Control Department.

The lower half of the chart represents the individuals assigned specifically to Customer Service Training Department activities. The Dealer Service Representative devotes his time exclusively to promoting better appliance installations. Servicemen encountering poor appliance installations in customers' homes, forward the facts to the Dealer Service Representative who contacts the appliance dealer. Those calls are made with the intent of helping the dealer with his installation problems.

In most cases, lack of knowledge was found to be the reason for poor work. Dealers, as a group, are interested in maximum customer satisfaction and willingly cooperate in having their installers receive training. Courses of instruction directed at specific problems are organized and conducted by the Dealer Service Representative. When large groups attend those meetings, one or more instructors lends assistance. During 1945, eighty-eight meetings were held with a total of 7,519 man-hours of attendance by groups such as plumbers, appliance installers, Federal Housing Project maintenance men, and Los Angeles Board of Education maintenance men.

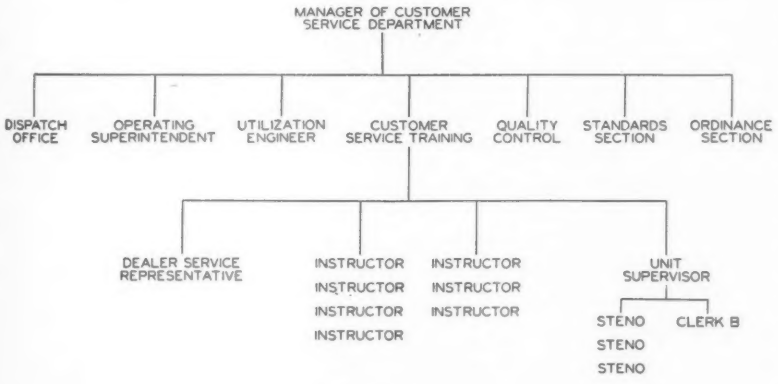


Figure 9

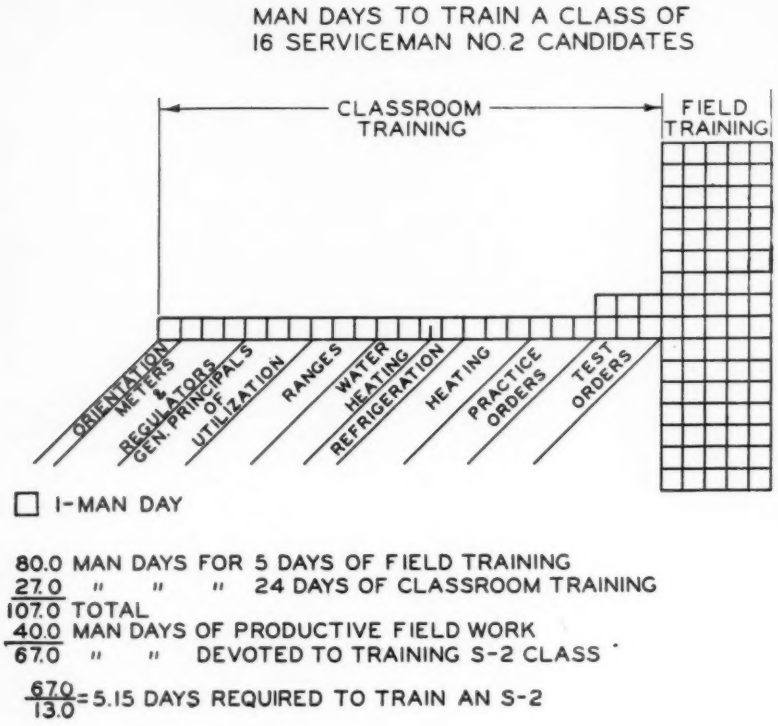

MAN DAYS TO TRAIN A CLASS OF
16 SERVICEMAN NO.2 CANDIDATES
CLASSROOM TRAINING
FIELD TRAINING
ORIENTATION METERS
REGULATORS GEN. PRINCIPALS OF UTILIZATION
RANGES
WATER HEATING REFRIGERATION
HEATING
PRACTICE ORDERS
TEST ORDERS
1-MAN DAY
80.0 MAN DAYS FOR 5 DAYS OF FIELD TRAINING
27.0 " " " 24 DAYS OF CLASSROOM TRAINING
107.0 TOTAL
40.0 MAN DAYS OF PRODUCTIVE FIELD WORK
67.0 " " DEVOTED TO TRAINING S-2 CLASS
67.0 / 13.0 = 5.15 DAYS REQUIRED TO TRAIN AN S-2

Figure 10

It is the instructors who conduct the basic courses that are currently being held in constant session. The organization of the Southern California Gas Company . Customer Service Training Department would normally require that only two basic courses be conducted. The service personnel is divided into two groups. "Serviceman 2" is the lower classification with job duties involving less responsibility and experience than the higher "Serviceman 1" classification. Separate courses are conducted to supply replacements for the No. 2 group and to up-grade men in this group into the No. 1 classification. Despite the tight labor market in 1945, 16,560 student hours of classroom training were devoted to those two activities.

During 1945, servicemen who had served in the Armed Forces began to return in relatively large numbers. A special ten-day course was inaugurated to re-establish those men in their old jobs. That course has been in session continuously since November 13, 1945. Two thousand four hundred and forty student hours of classroom instruction were devoted to that activity during the latter part of 1945.

The severe shortage of servicemen during last year restricted the number of meetings held for experienced men. Only one series of 31 meetings, involving 1,730 man-hours, could be justified. Those sessions were devoted to range servicing. Several points were covered but range calibration was the principal subject. The meetings were held, despite manpower shortages, to publicize improved methods which materially reduced the amount of time required to complete certain operations.

One thousand seven hundred and ninety-five student hours spread over 50 meetings were spent in an 18-hour course for clerical employees. The course was conducted primarily for Dispatch Office personnel who contact the public by telephone. It was found that those people were better able to handle customers' calls after they had received instruction on appliance operation and adjustments.

In addition to conducting classes, instructors submit weekly reports of students' progress, prepare training course material, build training props, and write

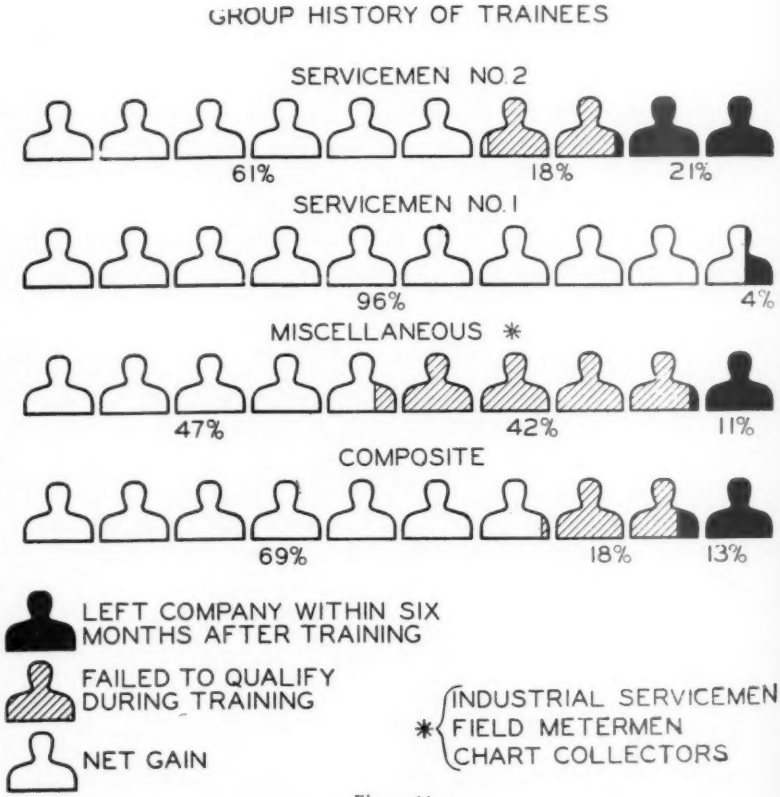


Figure 11

bulletins relating to mechanical problems. Nineteen hundred and forty-five did not usher in many new appliances or accessories. Only 17 bulletins were issued to guide servicemen in performing mechanical adjustments on appliances. The new equipment just now reaching the market is accelerating the mechanical bulletin activity. As additional models of complicated design are produced, the routine of keeping servicemen informed of new developments will become increasingly important.

Course Organization

The Serviceman 1 and Serviceman 2 courses are organized along similar lines in that they are divided into subjects dealing with various appliances, followed by practice orders in the controlled conditions of the classroom, and concluded with instruction given in the field. The process of training an inexperienced man to the level of a Serviceman 2 is more difficult than upgrading a Serviceman 2 to the Serviceman 1 classification. Figure 10 illustrates the organization of the Serviceman 2 Course.

The 29 squares on the horizontal plane indicate the 29 days necessary to administer the complete Serviceman 2 course. Each square on the chart represents one instructor-day devoted to training a group of 16 students. During the first 21 days of instruction relating to the subjects indicated, it is possible for one instructor to control and direct the group's activities. During the last 3 days of classroom training, when test orders are administered, it is necessary to assign two instructors to the project.

At the conclusion of the classroom training period the students go into the field accompanied by a person qualified to give further instruction and observe their field practices. Supervisors, Service Inspectors and Time Study Analysts assist in this phase of the work. During the field training period, approximately half of a normal day's work assignment is completed by students on each of the 5 days.

In summarizing the man-days of instructor time necessary to train a class of 16 Servicemen 2, the following points are pertinent: 80 man days are necessary for five days of field training; 27 man days are required to conduct 24 days of classroom training. Forty man-days of field work completed during the field training period should be subtracted, leaving 67 days devoted to training the group.

Data which will be explained in conjunction with Figure 11 shows that 13 students out of a class of 16 applicants will meet the established requirements and be assigned the Serviceman 2 classification. When the 67 instructor-man days are divided equally between 13 students, 5.15 man-days are required to train an inexperienced man to perform the duties of a Serviceman 2.

A chart of the Serviceman 1 course would closely resemble Figure 10. The 24 days of classroom work are distributed differently between subjects and only two days of field instruction are scheduled as a part of training. The shortened field training period reduces the amount of time to train a Serviceman 1 to approximately 3 instructor man-days.

It should be remembered, however, that the above figures are based on the assumption that classes can be filled to capacity each time they are scheduled. Such an arrangement is not always possible. Operating needs and limited numbers of recruits often make it necessary to conduct classes for smaller groups with a corresponding increase in the instructor hours devoted to individual students.

Manpower Gains

A graphic representation of the manpower gains (expressed in percentages) obtained through training is shown in Figure 11. The chart is broken down into sections analyzing the major training activities conducted during 1945.

In the Serviceman 2 group, 18 per cent of the applicants were disqualified during the training period; 21 per cent left the employ of the company within six months after being trained, leaving 61 per cent of the persons trained as the net gain. A part of the 21 per cent who left the company after completing their training period were asked to leave because of poor performance records, but a substantial number left on their own initiative to accept work more to their liking.

The data illustrated in the Serviceman 1 section of the chart is based on a rather small sample and may not be completely valid. One conclusion, however, may be drawn; it appears that the screening done in the Serviceman 2 course was quite effective because those men who successfully complete the Serviceman 2 course have little difficulty in qualifying for the Serviceman 1 assignment. That point is based on the fact that no failures occurred during training and only 4 per cent of the group left the company within six months after they completed the course. Again, in the miscellaneous group a small sample was involved.

The relatively high percentage of failures during training can be attributed to several factors: In one case we were obliged to attempt to train several

SERVICEMAN NO. 2 PROGRESS CHART

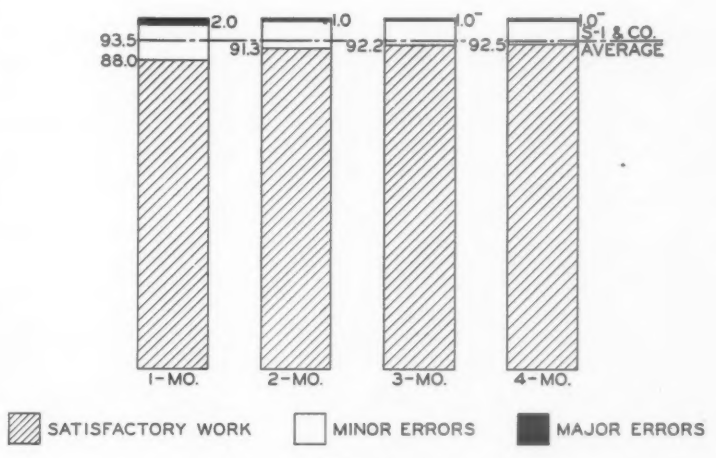


Figure 12

individuals for jobs obviously beyond their capacity. In the case of another classification, the dearth of specialized talent available on the labor market resulted in a high percentage of failures.

Post-Training Progress of Students

The performance of recently trained servicemen is closely followed by the Quality Control section of the Customer Service Department. Frequent samples of the new man's work in customers' homes is inspected and monthly reports on the progress of each individual are prepared. The nature and frequency of the errors guide the foreman in the follow-up training he gives the man by riding with him in the field.

Data taken from Quality Control studies was used to prepare Figure 12 showing the progress of new Servicemen 2. The shaded section represents the percentage of work performed in a satisfactory manner. The white area denotes minor errors, while the black section indicates major errors. The base line used on that chart as an indication of normal performance is not completely valid when used in this manner because it was established by the Serviceman 1 group whose job duties are more exacting than the job duties of the Serviceman 2. Regardless of the questionable validity of the base line, the learning curve of new Servicemen 2 indicates that within four months the field error frequency should closely approximate that of the Serviceman 1 group averaging about 12 years seniority.

Much credit is due the supervisors for the work they have done with the men assigned to them. It has been observed that the rate of a new man's progress is usually directly proportional to the amount of attention he receives from his supervisor. It is evident therefore, that the post-training success of students should be attributed largely to the foremen.

Summary

The objectives we hope to achieve in the basic courses of training are twofold. First we are under the necessity of releasing a mechanic capable of meeting the customer's immediate needs. This is a must as an end product of training. In addition, we feel responsible for giving the new employee a sound foundation of fundamental knowledge which will assure continued development of the individual on the job.

Refresher Training in Resuscitation

BY A. GORDON KING

Secretary, Accident Prevention Committee, American Gas Association

THE Brooklyn Union Gas Company (Brooklyn, New York) Prone Pressure Committee met on June 19 in the General Office Auditorium to review Prone Pressure methods prior to starting employee training this summer. Representatives of all departments and divisions of the company were present and will carry the message to their several groups to the end that all employees may review their knowledge of the infinitely simple procedure that may save a human life. T. J. Perry presided.

Since the inception of the McCarter Medal Award in 1923, administered by the American Gas Association and made by its Executive Board, following examination and recommendation by the Accident Prevention Committee of the Association, the records show that more than 800 lives have been saved. Since only employees of member companies are eligible for the Medal it is certain that many more persons owe their lives to the application of artificial resuscitation by fellow workers who have mastered this simple and not-easily-forgotten procedure.

Further, the reference to "summer" in Mr. Perry's address is of great significance wherever people have an opportunity to bathe and swim. Many a gas company employee, on vacation or just "happening by" has taken-over in emergencies involving the "apparently drowned" and, by application of the procedure he knew so well, saved another life.

Mr. Perry, who is superintendent of the Customers' Service Division, is chairman of the company's Prone Pressure Committee and, in addition to introductory remarks, took his audience through the manual of procedure, sentence by sentence. Trained teams assisted by making demonstrations of the procedure and a question-and-answer period was provided.

The McCarter Medal Award Committee of the American Gas Association is composed of J. M. Orts, Public Service Corp. of New Jersey, chairman, W. T. Rogers of Ebasco Services Incorporated and W. F. Brown of Consolidated Edison Co., of New York, Inc.

New Freedom Gas Display Attracts Home Builders

Display of The Hartford Gas Company at the Hartford Times Home Building Show held at the Times Radio Center, Hartford, Conn., on May 18-25. With a total attendance of 12,000, much interest was shown in the New Freedom Gas Kitchen and in gas house heating. The gas company distributed 15,000 pieces of promotional literature and gave away the gas range displayed in the kitchen as a door prize. Donald R. Schively, manager of promotion, directed the gas display

Center spread and cover design of 4-page promotional folder

Novel Gas Company Promotion

A NEW idea in gas company promotion has come to the attention of this Association through one of its member companies who has taken full advantage of the opportunity offered.

After a period of minimum activity during the war years, the progressive Bridgeport (Connecticut) Chamber of Commerce has instituted a novel and effective program to bring new industries to Bridgeport. This idea takes the form of promoting Bridgeport's advantages separately in attractive and convincing printed pieces. Only one feature is described in each folder, and the entire promotion program calls for twelve of these issued from time to time.

The purpose of this article is to draw attention to the folder on "Gas Service" on which the local company, The Bridgeport Gas Light Company, cooperated in furnishing the information and subject matter. The Chamber of Commerce gave the gas company a free hand and they produced an outstanding promotional piece featuring the many advantages of gas fuel in their territory. The gas company bore the expense of producing and printing the folder for the Chamber, and also had a considerable quantity run off for their own use in soliciting new business and new industries on their lines. A significant part of the folder is a description of the type of gas furnished and the general rate for gas service.

Three of these folders have already been published, "Telephone Service," "Water Supply," and "Gas Service." Subsequent subjects planned will feature: Transportation, Recreation, Industry and Labor, Education, Housing and Population, Municipal Departments, Public Relations, and two other subjects.

Each folder is four pages, 8½" x 11" and has the same masthead which embodies the trademarks of the many leading industries. Throughout the series the special advantages of their metropolitan area will be emphasized such as the large market area, warehousing facilities, that Bridgeport is a Customs port, and that adequate national banking facilities are available. Prospective retailers have 510 square miles and nearly four hundred thousand population as a trading area. Three daily and three weekly newspapers cover the needs of the community as well as a local radio station which is a member of the popular Yankee network.

The production of such a trade development folder is not too involved. The American Gas Association can furnish art-work and any features used in the Association's national advertising. Local industries will be glad to furnish illustrations or photographs of their gas installations, and the gas company should be able to furnish local statistics and other pertinent information to set forth the advantages that gas has for the prospective industrial or commercial user.

A copy of the Bridgeport "Gas Service" folder may be had by addressing: Industrial and Commercial Gas Section, American Gas Association, 420 Lexington Avenue, New York 17, N. Y.

Carbon Black Sales

BOTH production and sales of carbon black exceeded one million pounds for the first time in 1945, according to the Bureau of Mines.

Production increased thirty-one per cent over 1944 to 1,052,798,000 pounds, aided by completion of several new plants. In the last months of 1945 production overtook the rates of sales and producers' stocks increased to 102,005,000 pounds on December 31, compared with 69,243,000 pounds at the end of 1944.

Gas consumed in carbon black manufacture increased twenty-one per cent over 1944 to a new record of 431,830 million cubic feet. The average yield of carbon black was 2.32 pounds per thousand cubic feet of gas in 1945 and 2.20 pounds in 1944. The average value of natural gas used increased to 2.28 cents per thousand cubic feet from 1.62 cents in 1944 and was more than double the average (1.13) of 1941.

Wins Brand-Name Award

John W. McNair (right), vice-president and general manager, Standard Gas Equipment Corp. of Baltimore, Maryland, receives the Brand Names Research Foundation golden and centennial "Certificates of Public Service" from A. O. Buckingham. The certificates were awarded in recognition of 116 years of continuous service of the brand name "Acorn" and 51 years service of the brand name "Vulcan." These names identify Standard Gas ranges and gas-fired cooking equipment

Home Economists View Gas Industry Display

The American Gas Association Display at the American Home Economics Convention held at Cleveland, June 23-27, shown here, featured the New Freedom Gas Kitchen and spotlighted booklets issued by the Home Service Committee. More than 3,500 visitors stopped at the A. G. A. booth, admired the two miniature kitchens, studied the Home Service booklets and left orders for large quantities of kitchen-planning material and other Association literature. Miss McQueen and Home Service Directors from many utilities throughout the country played an important part in the proceedings of the national association, Miss McQueen appearing as a speaker on a panel discussion on housing

Final Hearings in Natural Gas Investigation Now Underway in Washington

FINAL hearings in the natural gas investigation by the Federal Power Commission opened in Washington, D. C., on June 17 with about 75 persons present at the opening session. This phase of the investigation will conclude the taking of testimony which began in Kansas City in September, 1945, and is expected to be completed in the latter part of July.

The natural gas industry sponsored two witnesses on June 18. The first, John H. Poe, Tulsa attorney, made a strong statement supported by legal argument against any attempt of the F.P.C. to interfere with production and gathering. He cited the industry's efforts in cooperating with State conservation measures.

The second natural gas industry witness was Samuel H. Crosby of E. Holley Poe and Associates, who made the following specific recommendations:

1. The F.P.C. determine service areas of all natural gas companies under the Act so that those companies having no direct competition might thereafter be released from the burden of complicated and expensive certificate procedure in carrying on future operations.

2. That the F.P.C. confine nonutility intervention in natural gas cases (principally coal, railroads, labor, etc.) to situations where there is an actual competitive condition affecting such intervening parties—as distinguished from the present practice of allowing these nonregulated parties full liberty of the record because of general industrial competition for the consumer dollar.

3. The F.P.C. simplify its certificate procedure pending determination of the service record and cut out time-consuming practices.

4. That the F.P.C. conform to the new Administrative Procedure Act immediately so as to avoid unnecessary burden on gas companies under present practice.

Appearing on June 20, P. C. Keith, president, Hydrocarbon Research, Inc., gave extensive testimony on various aspects of chemical synthesis from natural gas and solid fuels. He described the Brownsville, Texas, plant being built by his company to convert natural gas to gasoline and made interesting observations concerning the economy of processing coal at the mine and piping gas to consuming centers. Much of his testimony covered the same ground as the paper he presented at the recent A. G. A. Natural Gas Spring Conference which was published in the June issue of the A. G. A. MONTHLY.

At a later session, on June 24, Alfred R. Howell, director of research, Koppers Co., said he doubted Mr. Keith's prediction that it would be economical to process coal at the mine for making gas. He gave it as his opinion that the total cost of gasifying coal for piping to consuming centers would be about 41¢ per M cu.ft. rather than the 19¢ estimated by Mr. Keith.

The Bureau of Mines through eight witnesses gave testimony on research in the gas industry and on coal, oil and gas reserves.

Major portion of the natural gas industry's case will be presented about July 15 and is expected to take a week or ten days. Meanwhile, the railroad and coal interests, and others will present additional testimony.

From the record of all the hearings it is expected that the Federal Power Commission will make its report to Congress in the late Fall.

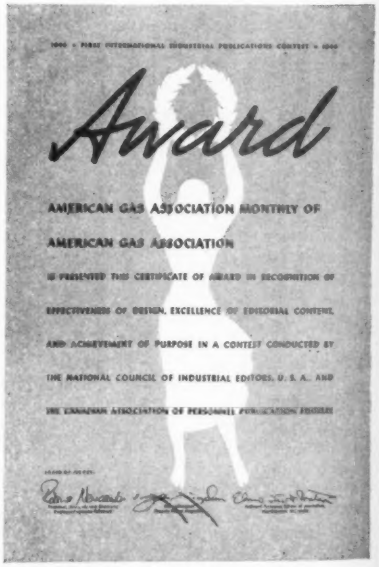
A. G. A. Monthly Scores in Magazine Contest

FOR the second time in two years, the AMERICAN GAS ASSOCIATION MONTHLY has received recognition in the industrial magazine field. In the first international industrial publications contest conducted by the National Council of Industrial Editors, U. S. A., and the Canadian Association of Personnel Publications Editors, the MONTHLY received a certificate of award for "effectiveness of design, excellence of editorial content, and achievement of purpose."

Approximately 580 publications in a wide variety of industries were entered in the contest which was unique in that every entry was judged on a point basis, those scoring 80 or more points automatically winning awards. About 80 magazines were judged to be of sufficiently high calibre to earn awards. There was no attempt to classify them in order of merit, all winners receiving the same citation.

The board of judges consisted of Bert Newcomb, president, Newcomb and Sammons; H. J. Higdon, editor-designer, Phoenix Flame Magazine; and Elmo Scott Watson, assistant professor, School of Journalism, Northwestern University.

In 1945, the MONTHLY was selected as a "leader" in a magazine contest conducted by the National Council of Industrial Editors.


1946 • FIRST INTERNATIONAL INDUSTRIAL PUBLICATIONS CONTEST • 1946

Award

AMERICAN GAS ASSOCIATION MONTHLY OF

AMERICAN GAS ASSOCIATION

IS PRESENTED THIS CERTIFICATE OF AWARD IN RECOGNITION OF

EFFECTIVENESS OF DESIGN, EXCELLENCE OF EDITORIAL CONTENT,

AND ACHIEVEMENT OF PURPOSE IN A CONTEST CONDUCTED BY

THE NATIONAL COUNCIL OF INDUSTRIAL EDITORS, U. S. A., AND

THE CANADIAN ASSOCIATION OF PERSONNEL PUBLICATION EDITORS

Artist at the Gas Range

Louis Diat, world renowned chef of the Ritz-Carlton Hotel and author of "Louis Diat's Home Cookbook," just published by J. B. Lippincott Company, prepares Cabbage Soup Country Style, one of the delicious yet economical recipes for which his mother's own French kitchen was famous. Monsieur Diat is shown cooking on a gas range—as it happens, one of the ranges approved by the American Gas Association. The recipe for Cabbage Soup Country Style appears on Page 12 of "Louis Diat's Home Cookbook"

Natural Gas Pipeline Expansion

NATURAL Gas Pipeline Co. of America has been authorized by the Federal Power Commission to expand its natural gas distributing facilities to the extent of more than $20 million. The May 17 order permits (1) Natural Gas Pipeline Co. of America and Texoma Natural Gas Co. to construct facilities increasing Natural's sales capacity by 85,000 Mcf daily, (2) Natural to sell natural gas to distributing utilities in Illinois and Iowa to serve mixed or manufactured gas markets, and (3) Chicago District Pipeline Co. to make pipe line additions to receive increased volumes of gas for distribution in the Chicago area.

Texas-California Pipeline Underway

AUTHORIZATION has been granted by Federal Power Commission to El Paso Natural Gas Co., Texas, and Southern California Gas Co., and Southern Counties Gas Co. of California, to construct and operate facilities, including about 1200 miles of interconnected pipelines, to transport natural gas from Texas and New Mexico gas fields to markets in the Los Angeles area. The pipeline facilities are designed to meet a developing shortage in local natural gas supply for three and a half million persons in Southern California. Cost of the project is estimated at $70,000,000.

This integrated pipeline system is planned for three progressive stages of construction and operation, with gas deliveries by El Paso to the California-Arizona border scheduled to commence by June 1947 and to continue for thirty years. The maximum contracted volumes to be delivered by El Paso are 125,000 Mcf per day the first year, 175,000 Mcf per day the second, third and fourth years, and 305,000 Mcf per day the fifth and succeeding years.

Preliminary work on the project has already started. The two Southern California gas companies will construct the portion of the line from Los Angeles to the California border, and the El Paso Gas Co. will build the balance of the line.

National Fire Protection Association Marks Fiftieth Anniversary

THE National Fire Protection Association is commemorating its fiftieth anniversary this year and has issued a booklet describing its organization and activities. As a member for many years, the American Gas Association has actively participated in the work of this unique body which is a voluntary association of organizations and individuals interested in the reduction of loss of life and destruction of property by fire. Following are a few highlights of its work as it affects the gas industry:

In 1917, the Committee on Explosives and Combustibles was replaced by three new committees, one of which is known as the Committee on Gases. This latter group was responsible for setting up the standards on city gas which were first adopted in 1919, and which have been revised from time to time since that date. They are now known as Pamphlet 54—"N.B.F.U. Standards for the Installation, Maintenance and Use of Piping, Appliances and Fittings for City Gas."

The American Gas Association is represented on N.F.P.A. Committees through C. George Segeler, Utilization Engineer. At the present time he is serving on the following committees:

Committee on Gases
Committee on Ovens & Furnaces
Committee on Air Conditioning

In addition to the Standards which are published by the N.F.P.A. through the action of these committees, they also maintain a field service to which the American Gas Association makes a small financial contribution. This field service makes direct contact through a paid staff with states and cities throughout the United States and Canada to stimulate fire protection and fire prevention practices. This work has been recognized as an important factor influencing the development of practices which have directly lead to substantial reduction in the loss of life and destruction of property.

The National Fire Protection Association also publishes statistical summaries of the principal causes for fires and it is significant to record that gas is among the least important of the causes of fire.

The American Gas Association takes pleasure in congratulating the N.F.P.A. on its first fifty years of successful activity.

Headliners at West Coast Technical Conference

Pictured at a luncheon during the West Coast Technical Conference on Domestic Gas Research held in Los Angeles, May 16-17, were: F. M. Banks, chairman, A. G. A. Domestic Gas Research Committee; R. M. Conner, A. G. A.; Henry Honer, Western Stove Co.; Eugene D. Milener, A. G. A.; LeRoy M. Edwards, Pacific Lighting Corp.; and R. L. Hayden, Coast Counties Gas & Electric Company

Gas Industry Joins Food Conservation Drive

THE gas utility industry, serving more than 20,000,000 customers in approximately 9,000 communities, has inaugurated an intensive food conservation and preservation campaign as its contribution to the national program to make food available to the hungry millions of the world, H. Carl Wolf, managing director of the American Gas Association, announced June 19.

The United States Department of Agriculture has designated July 15 to 22 as National Home Food Preservation Week. Beginning that week and continuing as long as the present urgency exists, the facilities of the gas utility industry will be utilized to focus national attention on the need for food preservation.

Hundreds of home service women of gas utility companies, operating in their local communities, will prepare and publicize special recipes and menus designed to conserve wheat and other essential foods and at the same time provide abundant nourishment for our own people. These women will carry to community gatherings and to individual homes the message that the foods thus conserved will increase immediately the supplies available for overseas use, Mr. Wolf declared.

In aiding the long range or food preservation program, the home service department of gas utility companies, working alone or in cooperation with community agencies, will make available to millions of women information regarding the canning and preservation of food. Demonstration kitchens and information centers will be maintained; home canning and food conservation classes and demonstrations will be arranged; lectures given; community projects fostered. Housewives will be shown that food preservation is vitally necessary to build a source of food supply within the home, so that domestic demands may be reduced during the winter months, thereby freeing stocks of fruits and vegetables for shipment to those who sorely need them.

The work of food conservation and preservation is not new to the gas industry, Mr. Wolf pointed out. In cooperation with governmental agencies and others, every phase of the program from gardening to canning was conducted vigorously and efficiently by the gas utility industry during the war years. The same knowledge and technique, and the same willing spirit of cooperation will now be devoted to helping win the peace through rendering aid to starving millions in Europe, Mr. Wolf said.

GI Brides Welcomed at Cookery School

TEAS, parties and other social events galore had welcomed GI brides from overseas upon their arrival in Portland, Oregon, but it remained for Portland Gas & Coke Company and the Welcome Wagon Service Company, with cooperation from the Daughters of the British Empire, to come up with a truly practical welcome—a school in American cookery!

One of the first of its kind in the country, the school prompted two radio broadcasts and coverage by the local press—even to editorial comment. An illustrated Sunday magazine feature also appeared in one of the local papers.

The "classroom" was the gas company's bright and cheery Hospitality House, an ultra modern gas kitchen situated on a platform at one end of a special demonstration auditorium on the lower level of the building.

Invitations to enroll in the school were extended well in advance and in person by staff members of the Welcome Wagon Service, a nation-wide organization whose business it is to welcome newcomers to communities in behalf of merchants and other sponsoring clients.

On the morning of the day that school began, a corsage was delivered to each GI wife who had indicated her intention of enrolling. This was but one of several gestures that drew warm praise from the "students."

Upon arrival at class, each GI wife was presented with a convenient and attractive loose-leaf binder in which to place typed recipes, bulletins and other information given out at each session. Blank sheets also were included for convenience in jotting down notes and memos.

An especially appreciated hand-out piece was the colorfully printed booklet, "Bride's Guide to Good Cooking—Northwest Fashion," which had been prepared by the Gas company's home service division to distribute to all new brides and which features recipes for preparing delicacies of the Pacific Northwest.

Classes were of the demonstration type and conducted by Rita Calhoun, home service director for the Gas company, who was assisted by Lois Heesacker of the home service staff. Informality was the keynote of the entire school. Questions and comments were encouraged and a friendly spirit prevailed throughout the entire series, the "students" looking ahead to each session with anticipation.

Rita Calhoun, home service director of the Portland Gas & Coke Company, Portland, Oregon, explains the function of a simmer burner to a group of GI wives from overseas

Single Long-Time Association Member Grows to Quartet

WHEN the A. G. A. MONTHLY last month set up the record of C. O. G. Miller, chairman of the board, Pacific Lighting Corporation, as "probably the oldest living member of the American Gas Association or its predecessor organizations" and called it a record for "old-timers" to shoot at, it had no idea the shooting would start so soon. After the smoke had cleared away, it was apparent that at least three members predated Mr. Miller's active membership record which began in 1891.

As of this writing (don't start firing yet, please), the MONTHLY *believes* that Arthur Graham Glasgow of Wood, Walker & Co., 63 Wall St., New York, N. Y., holds the record, having joined the American Gas Light Association in 1887 and continued his membership through the sequence of associations until the present time.

Next come two widely-known gas engineers, Alfred E. Forstall of Montclair, N. J., who joined the American Gas Light Association in 1888, and Alten S. Miller of Princeton, N. J., who became a member in 1889. Both men have maintained an unbroken record of membership.

Our hat is off to these four men who have loyally supported the gas industry these many years. If there are others who can match or better these Association records, the MONTHLY would be glad to amend the record accordingly.

Gas Production Research Committee Meets

Meeting of the Gas Production Research Committee of the American Gas Association held in New York on June 14, 1946. Left to right seated: J. W. West, Jr., R. M. Kellogg, G. Snedeker, P. T. Dashiell, chairman, Gas Production Research Committee, Edwin L. Hall, J. H. Wolfe, Karl Emmerling. Standing: A. Gordon King, R. H. Philipps, R. E. Kruger, E. G. Boyer, F. J. Pfluke, H. M. Henry, A. D. Harrison, A. B. Huyck, H. Carl Wolf, H. B. Noyes

Competitive Costs Committee Formed

Gebhard C. Beck

FORMATION of a Committee on Comparative Costs of Competitive Services and appointment of Gebhard C. Beck, The Brooklyn Union Gas Co., as chairman, has been announced by Everett J. Boothby, president of the American Gas Association.

Main objective of the committee is to study the cost position of gas service in relation to comparable services rendered by electricity, oil, coal and liquefied petroleum gases. The committee will also investigate the need for comparative tests of the performance of fuels where such data are essential and not now available and supervise the running of such tests when authorized by the Executive Board.

The work of this committee is expected to be of value to gas companies facing serious competitive fuel threats. One specific function will be to assist government authorities in setting up valid fuel selection factors to be used in deciding the choice of fuel in government projects.

In addition to Mr. Beck, members of the committee are: H. R. Carlson, The Hartford Gas Co.; J. W. Carpenter, Long Island Lighting Co.; Guy Corfield, Southern California Gas Co.; Ralph W. Fouse, Consolidated Edison Co. of New York, Inc.; John Gardner, Central Hudson Gas & Electric Corp.; R. E. Ginna, Rochester Gas & Electric Corp.; E. J. Hatzenbuehler, Lone Star Gas Co.; T. L. Kemp, Citizens Gas & Coke Utility; L. R. Lefferson, Ebasco Services, Inc.; Leo Loeb, Loeb & Eames; Leon Ourusoff, Washington Gas Light Co.; E. J. Rothert, Cincinnati Gas & Electric Co.; Charles Young, Springfield Gas Light Co.; and C. George Segeler, American Gas Association, secretary.

Krug Appoints 85-Man Oil-Gas Council

AN eighty-five-member National Petroleum Council was named June 18 to advise J. A. Krug, Secretary of the Interior, and the department's oil and gas division on oil and gas matters.

The peace-time council, which includes fifty-five men who served at some time on the Petroleum Industry War Council, will be purely advisory. Members will serve without compensation.

In selecting the members of the council, Secretary Krug said in a statement, special attention was given to assuring a well balanced representation between large and small companies in all parts of the country and from all phases of both oil and natural gas industries.

The purpose of the council, he added, is "to continue the government-industry teamwork that proved so important a factor in the success of the war program."

Ralph K. Davies, who served throughout the war period as Deputy Petroleum Administrator for War, is head of the oil and gas division, created after the Petroleum Administration for War was discontinued some time ago.

Among those appointed to the council were: Burt R. Bay, president, Northern Natural Gas Co., Omaha; Stewart Crocker, president, Columbia Gas and Electric Co., New York; Leroy Edwards, president, Southern California Gas Co., Los Angeles; D. A. Hulcy, president, Lone Star Gas Co., Dallas; W. Alton Jones, president, Cities Service Gas Co., New York; Frank Lerch, president, Consolidated Natural Gas Co., New York; W. G. McGuire, chairman of the board, Panhandle Eastern Pipe Line Co., Kansas City; and Joseph E. Pogue, Chase National Bank, New York.

Standard for Pipe Threads Revised

COMPLETELY revised American-Standard for Pipe Threads, as approved by the American Standards Association in December 1945, has just been published by the American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y. This work was jointly sponsored by the American Gas Association and was carried out under the direction of A.S.M.E. Sectional Committee on Standardization of Pipe Threads, B2, of which A. G. A. representative A. S. Miller, consulting engineer of Princeton, N. J., was chairman.

The revised publication covers specifications, dimensions and gaging for taper and straight pipe threads including certain special applications. It replaces A. S. A. Standard for Pipe Threads approved and published in October, 1942. Dating back to 1913 when a committee was first formed to re-edit and expand the Briggs Standard, much work and revising of standards has been done. The present Standard culminates studies of proposed standards by groups of specialists throughout the country.

To increase the usefulness of the American Standard for Pipe Threads to the industries, the text and tables have been rearranged and an extensive appendix added. This appendix, though not considered as part of the Standard, gives additional data on the application of pipe threads and records in abbreviated form the several special methods which have been set up for gaging some of the various applications of the American Standard Pipe Thread.

Natural Gas Manual Wins Friends

AN attractively printed, 40-page booklet entitled "Natural Gas—A Manual of Its Use in the Home" is now being distributed by The East Ohio Gas Company, Cleveland. Its contents include a brief history of natural gas and its use and separate chapters on each of the major gas appliances, illustrated with line drawings. There are also hints on food preparation, lunchbox planning, and a vegetable cookery chart.

While developed primarily as a piece of literature for school use, the original idea grew until a more comprehensive and generally useful booklet resulted. The home service department, as a part of its school program, gives a manual to each student in senior and junior high school food preparation classes.

Other group meetings, including fraternal societies, Parent-Teacher Association groups, Business Girls' Clubs, and Church Guilds receive the manual as a piece of literature. It has attracted much favorable comment.

Midwest Personnel Conference

PLANS for the general sessions on industrial relations at the American Gas Association Convention in Atlantic City the week of October 7 were announced at the A. G. A. Midwest Personnel Conference held in Kansas City, Mo., on June 6, by F. R. Rauch, chairman, Association's Personnel Committee and vice-president, The Cincinnati Gas & Electric Company.

Kurwin R. Boyes, secretary, American Gas Association, reviewed industrial relations developments from a national viewpoint before the meeting at which Chairman C. C. Jolley, Natural Gas Pipeline Company of America, presided.

An interesting and informative discussion on the practical selection and placement of new employees was led by M. B. Mathis, St. Louis County Gas Company. Kenneth Gilmore, Kansas Power and Light Co., gave a description of the aptitude tests used by his company and D. L. Sedgwick, of the same company, presented an excellent paper on supervisory training.

H. F. Voertman, The Laclede Gas Light Co., chairman of a subcommittee on the proposed joint meeting of the Midwest and the Southwest Conferences, reported a survey of the memberships indicated a preference for a two-day meeting in the fall with guest speakers at lunches and a dinner speaker.

Gas Maps Available

PUBLICATION of four maps useful to the utility industry has been announced by the Railroad Commission of California as follows: a 13-color map showing electric service areas in California as of May 1, 1945 ($1.25 plus sales tax); 8-color, 25 x 29-inch map showing gas service areas as of Jan. 1, 1944 ($1 plus tax); 8-color, 20 x 23½-inch map showing principal gas transmission, production and distribution trunk lines, gas and oil fields and manufactured gas plants as of Oct. 1, 1944 ($1 plus tax); and 19 x 23½-inch map showing electric generating plants as of July 1, 1944.

Requests should be addressed to the commission at the State Building, San Francisco 2, Calif.

A. G. A. Southwest Personnel Conference

THE thirteenth A. G. A. Southwest Personnel Conference was held at the Hotel Blackstone, Fort Worth, Texas, June 4. In the absence of Chairman H. D. Carmouche and Vice-Chairman Howard Senyard, former Chairman M. V. Cousins, presided. Kurwin R. Boyes, secretary, American Gas Association, reviewed the industrial relations situation in the gas industry.

Fred R. Rauch, chairman, A. G. A. Personnel Committee and vice-president, The Cincinnati Gas and Electric Co., called attention to the general session at the 1946 A. G. A. Convention to be held in Atlantic City the week of October 7, which will be devoted entirely to industrial relations matters, the program for which will be arranged by the Personnel Committee. Mr. Rauch invited all members of the conference to attend the meetings of the Personnel Committee to be held in New York, June 19, and in Cincinnati, July 19.

The conference reported and discussed company developments in job training, supervisory training, shift differentials, unionization activities, Case Bill, etc. V. H. Luneborg, secretary of the conference, reported that a questionnaire would be sent to the members concerning the plans for the joint conference with the A. G. A. Midwest Personnel Conference to be held in the Fall.

M. I. T. To Study Metal Corrosion

CORROSION of metals, cause of one of the world's greatest economic losses, will be studied in a coordinated program of instruction and research at the Massachusetts Institute of Technology, it was announced June 23 with the appointment of Dr. Herbert H. Uhlig as an associate professor in the department of metallurgy to take active charge of the project.

Dr. Uhlig, who joined the Institute's staff on July 1, is planning a fundamental research program with the study of the nature of metals and metal surfaces as its main objective. The problem will be attacked largely from the electrochemical viewpoint and is expected to lead to a more logical approach to the selection of corrosion resistant metals and to methods of protection.

PRIMARY AIR INJECTION

(Continued from page 314)

at which the burner will operate, the type of appliance plays a predominant role. Combustion space, secondary aeration, gas rate and the like must be taken into consideration. On the other hand, the burning characteristics of the gas may limit the amount of primary air which may be used with a given set of conditions. However, adjustments of port loading or rate per sq.in. of port area can take into account variations in the burning characteristics of the gas, keeping in mind the possibilities of pressure increase. Generally, it would be well to design for the worst field conditions anticipated, these conditions including low gas pressure and low gravity gases. Reference should be made to Research Bulletins Nos. 10, 13 and 26 in which this phase of the subject is discussed in more detail.

Convention Calendar

SEPTEMBER

9-11 •Appalachian Gas Measurement Short Course, West Virginia University, Morgantown, W. Va.

10-12 •Pacific Coast Gas Association annual convention, Fairmont Hotel, San Francisco, Calif.

12-13 •Midwest Industrial Gas Council, The Radisson Hotel, Minneapolis, Minn.

16-18 •Controllers Institute of America, New York, N. Y.

OCTOBER

Wk. of 7th •American Gas Association, 28th Annual Convention and Exhibition, Atlantic City, N. J.

7-11 •34th National Safety Congress and Exposition, Stevens Hotel, Chicago, Ill.

NOVEMBER

11-14 •National Hotel Exposition, Grand Central Palace, New York, N. Y.

18-22 •National Metal Congress and Exposition, Atlantic City, N. J.

DECEMBER

2-6 •American Society of Mechanical Engineers, New York, N. Y.

2-6 •National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York

1947

MARCH

20-21 •New England Gas Association, Boston, Mass.

EMPLOYEES' MEDICAL RPOGRAM

(Continued from page 311)

panies. The benefits have been extended to approximately 3700 Class A members (employees), 3000 Class B Members (wives of employees) and 2200 Class C members (children of employees). In almost eight years of operation, during which time each organization has proven itself self-sufficient, a total of over $600,000 has been collected through the medium of dues of which the amazing sum of over $440,000 has been paid out in benefits and an additional $30,000 for operating expenses. The balance which is held in reserve is equivalent approximately to 14 months' dues per member.

A Customer Service Policy

Joint A. G. A.-E. E. I. Customer Relations Committee Report

BY PAUL E. EWERS

Subcommittee Chairman, Michigan Consolidated Gas Co., Detroit, Mich.

LET us suppose that we are members of a new public utility organization just starting in business. We have been given the responsibility of formulating a customer service policy comprehensive enough to cover all phases of our business which may directly affect customers from the time they first request our service until they finally leave our lines.

At the outset we will recognize that any enterprise to be long successful must have an objective—a goal toward which all efforts will be focused. History shows that most prosperous businesses have included as a major objective, agreeable customer relations. We therefore will assume favorable public attitude to be a basic aim of our new organization.

Policies are plans designed to achieve objectives. Hence, our Customer Service Policy will be centered around those phases of the business which may influence customer attitude most directly. Emphasis will be limited to segments of the plan which country-wide utility experience dictates are especially concerning.

Business Facilities

To develop a thriving enterprise first of all we must have the necessary business offices, equipment and personnel. Business facilities provided for customers must be measured by the yardstick of adequacy, customers' convenience and satisfaction, whether customers choose to do business with us by mail, telephone or personal call.

The location of our offices will be chosen with first consideration to accessibility by both public and private transportation. In urban areas customers will be able to park their cars conveniently and transact other ordinary business nearby. In rural and semi-rural areas, offices will be so located that telephone service is available to the customers served with not more than nominal toll charges.

Our business offices will be well-lighted, cheery, neatly arranged, and clean. Personal contact areas will be located on the ground floor, near main entrances. They will please the eye, offer maximum convenience and make functional use of the service we sell. While transacting business, customers will be comfortably seated beyond the hearing range of other customers. Most people hesitate to talk freely before others. Those who do are either ill at ease or so emotionally upset they don't care who hears them. In any event, telling their troubles within earshot of other customers can accomplish little more than to spread customer dissatisfaction and make the interviewer's job much more difficult.

Telephone facilities will be adequate for all contingencies. Will our customers have a friendly feeling toward us if, when they call by telephone they get busy signals or wait several minutes before receiving attention? Remember, the customer's time is valuable, too! Good customer relations demand telephone equipment and manpower sufficient to provide promptly all necessary service around the clock, on week-days, Sundays or Holidays, and during peak periods.

Similarly, the machinery for answering customers' letters will be geared to the volume and scope of the correspondence received. The customer's letter is his representative. We would treat as utterly ridiculous any thought of telling a customer who comes to our office, "You'll have to wait a few days for attention." Yet many utilities all over the country take from 3 to 6 days or longer to answer correspondence. Ours will be answered as received, daily.

Our equipment will be so complete and adequately maintained that whatever the job, it can be accomplished with efficiency and skill. Well maintained, appropriate equipment will impress customers and equally important will merit the pride of the operating employees, inspiring the best possible work for customers. Further, this equipment always will be used with utmost consideration for others. For example, everyone will see our company's vehicles on the streets. The manner in which they are operated is as important as any other factor in molding good relations with our customers. At all times, our trucks and cars will be driven as though all drivers and all pedestrians were our customers—and almost invariably they will be.

Monogrammed vehicles will not be assigned to employees handling complaint or collection work. To assign identified cars to such employees might expose customers who raise questions or who are temporarily unable to pay bills to needless embarrassment. Embarrassed customers are never cooperative customers.

The best Customer Service Policy ever proposed would fail miserably in practice if administered by poorly-selected employees. When one sees those in some organizations who are dealing with customers he might be reminded of the following description of a customer service employee:

"He is a person past the age of productive usefulness, a mental reject, incapable of straight-thinking, opinionated yet passive, non-committal, with eyes like a codfish, polite in contact, but unresponsive, cold, calm and damnably composed; a human petrification minus compassion or a sense of humor. Happily, he never reproduces and when he finally dies will be mourned by no one and remembered only by his creditors."

All employees selected by us for any job involving either meeting or talking to customers will be chosen because they possess the qualities needed to create favorable customer reaction. They must have the personal attributes which people like—be eager to serve others, affable, energetic but patient, and courteous. They will not be selected for this type of work solely on the basis of extensive knowledge of company rules and practices—never, regardless of background, education or age, if their personality characteristics or attitude would cause customer irritation.

Selection will be followed by thorough and complete training, both in the mechanics of the job and the most successful methods of dealing agreeably with customers. The training program will be followed by a period during which these employees are constantly observed until supervisors are fully satisfied that they can and will meet minimum job performance standards.

Provisions for Service

The nerve center of a Customer Service Policy is in its provisions for service. One of the most successful ways to increase sales—an obvious goal to which all policies should point—is to make it easy for customers to do business with us. Though the customer's wants are many or few, complex or simple, touching on one or several phases of the com-

Presented at Joint A. G. A.-E. E. I. National Accounting Conference, Cincinnati, Ohio, April 1-3, 1946.

pany's activities, we will give him "one stop" service, whether he telephones, calls in person or writes us.

Not so long ago a lady customer stormed into the General Manager's Office of what was considered a fairly progressive organization. As she burst through the door imagine the astonishment of the G.M. as she exclaimed, "Oh! I thought this was the way out. I came in a half hour ago with what I believed to be a very simple request but I've been directed to so many departments and asked to see so many different people that I'm now so tired waiting for attention and so utterly confused I've forgotten what I wanted."

Such a story may be labelled an exaggeration. Yet at least to a lesser degree it happens in many offices daily. Our offices will be provided with centralized groups where any customer may bring his requests by telephone or in person, regardless of number or nature, and receive prompt and complete service. No other duties will be assigned to these groups which might in any way interfere with their sole purpose—to make it simple and easy for customers to do business with us.

Customers' Memory Long

New customers will long remember the treatment received when they first apply for service. They will take with them an impression—good or bad—which will determine their attitude toward us, perhaps for years to come. We'll show these customers that we are glad to serve them. Our conversation with them will emphasize a genuine welcome. The questions we ask will be few—just those which are necessary to determine paying habits or ability to pay.

Old customers will be cordially received back on our lines. Even fewer questions will be asked of them—in fact, only those designed to establish continuity with previous accounts. We'll treat them as people we know; and we should, if we maintain proper records. We won't ask them to sign new contracts for service. Our original applications will be worded to provide for subsequent service requests at *any* address at *any* time.

Yes, and we'll connect service when requested to do so by telephone whether or not we have a signed contract. Many utility companies have operated for years without the formality of taking signed applications on residential accounts and their losses traceable to such arrogant disregard for legal technicalities have been nil. Let's be practical. Let's recognize that insistence on signed applications for ordinary accounts is unnecessary.

Promises kept build confidence. Commitments made by our company will be met if at all feasible. Commitments to perform the actual connection of service, for economic considerations, must be kept within reason. But ample latitude will be given responsible employees to promise work performance immediately whenever necessary. A service supplied when urgently needed can be a continuous, pleasant reminder to a customer. Likewise a service supplied only after genuine inconvenience has been caused can be a constant source of irritation.

Obviously, it is not practical to broaden every employee's knowledge and responsibilities to the point where anyone can handle to completion every conceivable request which could be made by a customer. What questions employees may or may not be qualified to answer are relatively unimportant. More important is their attitude. Certainly, they will not be expected to handle questions beyond the scope of their knowledge or experience. However, in our organization each employee will have an established avenue available to him through which all comments and requests with which he is unfamiliar will be given attention promptly. The mere existence of such a facility will do much to insure a proper attitude by all employees toward answering questions not directly related to their assigned jobs.

Reading Meters

No single group of employees will have a broader opportunity to maintain a high degree of customer good will than our meter readers. Their major functions will be threefold—to read meters accurately, to treat customers courteously, and to evidence real respect for customers' property. A single failure in any one of these functions almost certainly will cause subsequent problems in customer relations.

High work performance standards coupled with a program of close, alert supervision will be instituted to make sure that the efforts of our meter readers will help to achieve the goal toward which our Customer Service Policy points.

We will make it distinctly advantageous to read meters accurately. "On the job" observations will be conducted to see that our meter readers cheerfully answer customers' questions or pass them along. We'll observe the conduct of these employees on their routes to make sure there is no "horse play," jumping of hedges or fences, walking across lawns, undue haste, or any other practice which might cause customer displeasure. Finally, periodic re-emphasis will be placed on the importance of constantly looking for opportunities to compliment customers.

Rendering Bills

When we touch the customer's pocket-book we are playing with dynamite. It logically follows that customers are more critical of the size of their bills than any other segment of utility service. Further, people are creatures of comparison. Judgment of values is based almost exclusively on relationships with previous experiences. Hence, rendering of customers' bills for service boils down to a question of regularity, uniformity and accuracy. By setting up as many meter reading and billing units as there are work days in a cycle, and scheduling activities accordingly, we shall maintain uniformity in consumption spans and regularity in delivery dates.

Due dates will fall on the same day of the month from cycle to cycle except for Saturdays, Sundays and holidays. If at all practical, due dates will not be advanced; always retarded. Humans resist change. While customers will react unfavorably to any change, retarded due dates will cause less friction than those which are advanced, because retarded due dates seldom result in loss of discount.

The span between meter readings and bill delivery will be held to the barest minimum. Aside from the economic advantages, we know this practice will help customers associate their bills with demands on the service during the periods covered, thus reducing the number of questions and complaints.

Every customer will receive a bill each cycle. When unable to gain access to the customer's meter and no usable post card reading is received, we will render a bill based on previous usage. War experience has indicated customers' willingness to accept bills based on previous usage, *in those instances where a regular reading was not possible.* The average American lives from pay-day to pay-day and we impose a needless hardship when we permit consumption to accumulate before billing. People who live on a budget tell their money where to go instead of wondering where it went. But customers are not generally budget-conscious; frequently therefore funds are not available to pay bills larger than usual, even if a longer than average period is covered; embarrassment results, and the utility's prestige suffers.

Meter readings will be carefully scanned before bills are rendered, to intercept consumptions which do not conform to previous use patterns of accounts. Investigators will review such consumptions with customers, before bills are released. The psychological value of anticipating complaints is not to be minimized. Aside from curbing immediate complaints wasteful conditions will be found, explained, and corrected before *subsequent* bills are needlessly enlarged.

We plan to mail our bills rather than attempt delivery by our staff. Equities from a customer relations angle weigh heavily in favor of this decision. Postal laws are so worded that even with the permission of the owners, mail boxes may not be used for any purpose other than the receipt of United States mail. These regulations place even the most resourceful company bill deliverer at a definite disadvantage. Bills delivered in the same manner as advertising matter are often accorded the same treatment as advertising matter—and customers are left with the belief their bills were not delivered.

Every bill will be complete in itself. Regardless of the complexity of rates, one test will be applied to each bill—the average customer, with only the information shown on the bill, must be able to check our calculations.

When a customer moves from one address to another, consumption since the last regular reading date will be transferred to the customer's new account and included with the first regular bill rendered for that address. Experience points to the fact that customers appreciate this service, if such items are properly identified. It eliminates the need for paying an extra bill at a time when the customer is fully occupied with other considerations and reduces instances of misunderstanding resulting from a loss of or failure to receive a final bill from the previous address.

Scrupulous care will be combined with utilization of modern machine devices and accounting practices to insure the highest degree of accuracy obtainable in rendering all bills. Correcting an error found by a customer is understandably humiliating, but the disparaging effect of an error lingers because customers who have found bills incorrect will frequently mistrust all bills rendered thereafter.

Inquiries and Complaints

For years many utilities have regarded complaints, inquiries and requests from customers as simply necessary evils. They seem to have overlooked entirely the fact that problems brought to them are choice opportunities to convert otherwise unhappy customers into loyal boosters. Such a viewpoint is not mere wishful thinking. Companies which have sampled customer attitude invariably have found the highest percentage of favorable comment about the utility coming from those who at sometime have presented one or more specific problems to them.

Let us then consider how customers' problems will be approached, analyzed and acted upon by our organization to build and cement friendly customer attitude. We shall recognize what all students of human behavior tell us is true. Every person we meet is, in his own mind, *the most important person in the world*. The problem he brings, regardless of its concern to us, *is his most important problem* at that moment. The customer's primary interest lies in what we *can* do for him—not what we *can't* do for him.

Our approach toward every person's problem therefore, will be consistent with these three basic principles—we actually will treat each customer who comes to us as the most important person, we will give his story the patient, attentive ear which the most important problem would deserve, and we will shape our initial remarks to emphasize what we *can* do to solve the problem—not what we can't do. With this approach we shall sweep from our path most obstacles to a friendly, cooperative settlement of the difficulty.

With unfaltering patience *we will listen* until we have the customer's *full* story. Then, and only then, will we be in a position to determine what records are required to assist in analyzing the causes. Much depends here on the availability of primary records such as meter reading and billing data. These at all times will be as close to those dealing with the public as the dials on their telephones.

Inquiries and complaints generally can be classified into two groups; those caused by our failure to make some phase of our service completely dependable, accurate or fool-proof, and those over which we have no control.

When inquiries or complaints have been caused by our direct or indirect failure appropriate adjustment will be offered cheerfully, even enthusiastically, as a matter of course. Surprisingly few complaints or inquiries will fall outside the classification of direct or indirect responsibility unless our interpretation of responsibility and control is narrow. The day has long since passed when we could tell a customer, "Failure to receive a bill does not entitle you to the discount"—and make him believe it. And if he doesn't believe it what possible sense is there in telling him, save to antagonize? We are now living in a day when a broad view of responsibility and control is essential to a high degree of customer approbation.

There was a time, not so long ago, when it was considered weak to admit an error. It was believed that the admission, even though justified, would tend to undermine confidence in the infallibility of the organization. We might agree with the latter but never with the former. That the public believes utilities consider themselves infallible is not denied by any experienced customer contact employee. He has listened too many times to repeated assertions of this nature. Our policy will demonstrate that it is far better to be guilty of admitting an error for which actually we may not have been responsible, than *ever* to be justly accused of failure to acknowledge a mistake.

When in doubt as to responsibility or a course of action, we will give the customer "the break." Customers will be quick to recognize our generous decisions and will amply reward our organization in subsequent contacts both with us and with associates and friends.

There will be instances when the bald facts are so clear as to destroy all validity in a customer's claim. Here, without any effort, we could place the customer in an inescapable box. But what would we gain? Surely nothing more than a frustrated customer who would leave us vowing to get even some day. Such a customer, no doubt, was Mr. White who recently met a friend just as he was leaving a utility office. "Who did you talk with in there?", queried White. The friend answered that he believed he had talked to a Mr. Brown. "Oh, Brown!", he exploded. "I know him. He's the fellow with the glass eye." The friend stated he hadn't noticed that, whereupon White came back with, "Well, the next time you have to talk with him look carefully and you'll see in one eye the faintest gleam of human kindness. That's his glass eye."

No, the more certain we are of our facts the more careful we will be not to drive those facts home. Give the customer an "out." The discriminating customer will realize we have done so and will in his own mind thank us everlastingly. The others may feel that their unsound claim escaped detection, but the relief which they will experience will be quite sufficient to cause them to drop the whole subject, without rancor.

When adjustments are necessary, we will make them adequate. The good will created by being absolutely fair, by going just beyond the half-way mark, by avoiding a "one for me and not more than one for you" attitude will be worth infinitely more to us than the few extra pennies we deny ourselves. And let's not be afraid to let the customer write his own ticket. *Frequently* it will cost us less; *invariably* the customer will be completely satisfied.

If discussion by telephone or at our offices does not leave the customer with an obvious feeling of satisfaction or where the facts indicate the need for verification we will readily arrange for an inspection at the customer's premises. Those selected for this important work will have in their possession all pertinent discussion and record data and will be given ample authority to conclude the investigation in a manner thoroughly pleasing to the customer.

Whether our discussion ends in our office or at the customer's home or office we will never consider an inquiry or complaint properly closed until all of our findings have been faithfully given to the person or persons primarily concerned. It is not enough to conclude our discussion of a problem with Mrs. Customer if her husband has indicated his interest. We must be sure that he too is given full benefit of the facts disclosed. Satisfying one member of a household while another still has a question never settles a complaint. It merely postpones the day of reckoning.

Finally, customers who bring their problems to us, regardless of their nature, are doing us a distinct service. First, we know what they are thinking about, what they want, what they expect. This knowledge will be of immeasurable help in formulating sound plans and policies for the future. Second, rather than coming to us, if they take their troubles to neighbors, friends and others, our difficulties may be multiplied many fold for misunderstandings, rumors and small talk easily can create irreparable damage to good will. A sincere expression of appreciation to every customer who lays his difficulties before us is therefore not merely desirable, it is imperative.

Treasurer

(by Avery Giles)

He signs each paycheck with a sigh.
Except his own, they're much too high
To him whose monetary sense
Is keen to whittle down expense;
Red ink, not blood, flows through his veins:
In spite of him, our business gains!

—Printers' Ink

Paying Bills

No customer enjoys paying bills. Yet customers dislike to pay certain bills less than others. We are going to try to be sure that our customers dislike paying our bills less than other regular obligations.

Our offices and those of our agents will be located so that payment of our bills can and will be an activity incidental to shopping or business trips. The time between bill receipt and due date will be short enough so that bills will not be forgotten easily before the due date, yet long enough so that a special trip to the office need not be planned in order to save the discount.

Special emphasis will be placed on maintaining adequate personnel at each office, in order that payments may be taken with a minimum of time loss to customers. Yet, though we give each customer quick service, transactions will be conducted in an unhurried atmosphere, particularly pleasing to many customers who wish to conduct business at a pace set by themselves.

Each payment transaction will be individualized. We'll have none of the incidents such as that of the customer who paid his bill to a very sour looking lady teller. When he was handed his change he pushed a dollar bill back toward her saying, "I'll give you this if you'll smile." Her reply was, "Why should I smile on a job like this?" Our tellers will greet each customer with a spontaneous, sincere and friendly smile. Change will be counted out and each customer will leave our tellers with a pleasant, well enunciated, genuine "Thank you" ringing in his ears.

Minor adjustments which can be completed in a moment or two will be made to bills at tellers' enclosures. The customer who wishes to pay his bill and have an error in his address corrected, to pay only the unpaid portion of a bill which includes items outstanding at the time of issue, allowance of a discount, or any other simple, non-controversial contact will be accommodated at tellers' windows. In addition to giving quicker service, this decision was reached because customers don't like to handle their business piecemeal; they don't like to be sent from one person to another and they have a feeling that any employee in the business office should be able to handle any request they may make.

Lenient Collection Policy

We will accept payments at net one day following the due date without the absurdity of any comment that we are granting a concession. To say the least it is awkward to defend the practice of charging the gross amount one day following the due date while admitting that a mailed payment received the same day if postmarked the day previous would be accepted at net. We'll never injure our relations with customers by being as fair to those who pay their bills in person as to those who pay by mail.

Cumulative experience has taught us not to be tricked into the belief that our outstanding arrears will be increased or decreased substantially by the degree of severity or leniency of any collection policy or system. This same experience has shown that economic conditions will have a greater affect by far on the number and dollar value of overdue accounts. Hence, we shall commit ourselves to a collection policy which simply will insure reasonable control of arrears.

Every inducement which we can place before our customers to pay their bills without collection action will be utilized. Offering a discount for prompt payment, providing convenient bill paying facilities in every neighborhood, itemizing amounts and reading dates for arrears on current bills, will all aid in reducing the number of accounts on which actual collection action must be taken.

Recognizing that people almost universally abhor the appearance of a collector at their doors, we will precede any such activity with written reminders and where feasible, telephone calls, to induce payment. Selection of accounts to receive such treatment will be based upon age and amount of arrears together with the customer's past paying habits. But in no instance will any sticker, notice, or letter be so worded that it might be expected to cause offense or resentment, for even though we know before the written message is sent that the customer's payment habits are poor we cannot be sure of the precise cause of the current delinquency until we actually have contacted the customer.

Only accounts which justify interruption of service will find their way into the collector's hands—and then only when all milder forms of persuasion have failed and after the customer has been amply warned. Responsibility for the decision to interrupt service will be vested in the collector. His responsibility will be matched with the authority to postpone or alter normal action.

Threats, those gremlins of collection activity, will have no place in our policy. Little benefit will accrue from threatening to cut the customer's service when circumstances do not warrant, or from detailing all of the inconvenience and delay which the customer might suffer.

The act of discontinuing a customer's service because of unpaid bills is perhaps the most delicate of any we will be required to face. Certainly it will never occur until all other possible effort has failed, for it robs the company of a customer and of a most persuasive tool by which to secure payment. Our reluctance to take such action always will be emphasized but should disconnection become necessary it will be presented to the customer as an unhappy, though unavoidable step to prevent the accrual of further arrears which we honestly believe he could not possibly pay.

On accounts which are no longer active, collection treatment will be carried just to a point where continued effort simply would prove irritating to the customer or where further follow-up would entail costs greater than the amount owing.

Equipment Service and Dealer Relations

Full customer appreciation can be attained only if the equipment through which our products are utilized is a source of pleasure

(Continued on page 352)

OUT OUR WAY **By J. R. WILLIAMS**

VERY LATEST METHOD FOR RIDDING KITCHENS OF COOKING ODORS-- I PRESS THIS AND IN A FEW SECONDS THAT ROAST BEEF ODOR WILL BE GONE!
WAIT-- WAIT! I'LL TAKE A LOT OF IT OUT FOR YOU-- WAIT TILL I SOAK UP A LOT OF IT--
SMMMPH
ME TOO! MY SYSTEM SOAKS ALL TH' NUTRIMENT OUT OF KITCHEN SMELLS! LEAVE IT ON-- KITCHENS AIN'T KITCHENS NO MORE--THEY'RE GROCERY MORGUES!
ROSED BEEF
J.R. WILLIAMS
5-29

Reprinted from Rochester Times-Union

Even the comics are talking about kitchen ventilation

At the Foot of the Rainbow

BY JAMES W. CARPENTER

Vice-President, Long Island Lighting Co., Mineola, N. Y.

James W. Carpenter

FOR the last five or six years we in the manufactured gas utility business, as almost everyone else in commerce and industry, have been living and breathing in the sweet anesthesia of expectancy of the postwar wonder world. With great intuition the agile manipulators of statistics have been able to gaze into the skies and observe the brilliant and flashing lights from thousands upon thousands of bursting bombs and exploding shells refracting the inverted torrents of tears that have risen heavenward in piteous pleadings—and they have beheld a miraculous rainbow of better days and true to the legends of the rainbow, they have pencilled for us in overwhelming numbers, the limitless contents of the pot of gold at the foot of that rainbow.

"The Zebra Derby"

There has been no limitation to the specifications of the great miracles that are to descend upon us, there are no ceilings on the numbers of things to be sold or the prices to be obtained for them, there has been no pain or harshness in bringing the blessings of postwar living into the castle, the cottage or the cabin. In fact the splendor and the guile of all these outpourings have been so overwhelming that satire has found them easy meat for coldly, correcting comment.

In his currently best selling humorous book entitled "The Zebra Derby," Max Shulman has set forth some of the high sounding language of the architects of the World of Tomorrow. Listen to these brief quotations:

"War has shown us what we can do, Lodestone. War has re-taught us that which all of us except the wicked and timid have always known: that there is no problem which American ingenuity cannot solve. War has been a busy time for our people, but it has been a thoughtful time too. While some of us assured our country's destiny on the battlefields of the world, others stayed home and builded our future. An inventory was taken. The perspective of time revealed our old errors. Swept out now are the ills which made our nation imperfect. Erased are the infamies. Strong, healthy, and wise, we stand on the threshold of tomorrow."

"A time of social ameliorization, of new horizons, of disappearing borders, of light, of speed, of new skills, new industries, new techniques, new opportunities beckoning."

"A time of new horizons, new frontiers, of great social strides and the end of human misery."

Then recollect how similar these recitations of the girl on the hillside in this book are to things you have heard in our own industry:

"They got what they call 'dynamic' furniture," Lodestone continued. "The chairs vibrate all the time so dust can't never settle on them."

"They got a fireplace on a track that revolves around you while you sit; your back never gets cold."

"Chemical wall paper that turns yellow and brown in the fall and green in the spring."

"They got robot radios shaped like a person that dances with you while it plays music. They got man radios for ladies and lady radios for mans."

And finally contemplate the discussion in this amusing passage:

"Yes sir. I got a report from the Bureau of Real Smart Economists that would knock your eye out. Here are the actual figures they got from a poll of the American public taken during the war; each family would spend an average of $7,800 for a helicopter, $9,000 for a new home, $3,100 for property improvements, and $4,600 for river and harbor drainage. And here's another figure that will give you something to think about: In 1900 four percent of the population was sixty-five or older. In 1970 twelve percent of the population will be sixty-five or older. On the other hand, in 1900 forty-four percent of the population was twenty or younger, but in 1940 only twenty-seven percent of the population was twenty or younger."

"That sure is interesting. But what's that got to do with postwar business?"

"It's something to think about, isn't it?"

"The whole country is ready to buy things, new things. Science is ready to provide new things. And we are ready to sell. Perfect."

"Exciting."

"Whole new worlds are open to us, Asa. Products that people never dreamed of. Plastics. Electronics. Atomics. Supersonics."

"It sounds wonderful, Alaric. What are we going to sell?"

"Cooky cutters," said Alaric.

Well, so it seems to be. Through trial and tribulation we have reached the Promised Land, we have come to that place in time when we stand smack dab at the foot of the rainbow and we have had our try at unloading the precious metal from the Pot of Gold—and there seems to be so very, very little of it. Today is the glad carefree tomorrow of yesteryear, yet we face the cold gray dawn of reality.

Rainbow a Mirage

In actuality we probably all know that the rainbow was a mirage and that the oasis of greater business without effort or cost is not yet under our feet. We know now that the statistician, the dreamer, the optimist could amass overwhelming figures of things to be available, of new and undreamed of products that would appear and they could multiply the number of people or the number of homes by the number of unit sales to produce a sales potential that was mathematically astronomical. But they neglected that trivial detail of comparing the total sales price of the totals of all the latter day purchases with the actual or potential cash in the hands of the buyers. And they disregarded the rather signficant factor that the people who were smart enough to put their funds into war bonds would be foxy enough to hold onto them unless these pieces of governmental collateral were pried out of their clutches by old-fashioned, persuasive selling that showed conclusively the immediate and realistic benefits of a prompt purchase.

So we have learned rather promptly, and thus profitably, that there may be some pent-up demand but it will disappear rapidly under the drive of production or the competition of the better salesman who can draw the attention of our prospects over to his more enticing offer for the dollars that the purchaser is willing to spend. One survey of recent date has put it thus:

Presented at A. G. A. New York-New Jersey Regional Gas Sales Conference, Rye, N. Y., April 11-12, 1946.

"While there is undoubtedly a large pent-up demand for appliances, selling will not be merely a matter of announcing 'I've got "em" ' and sitting down with an order pad while eager customers form a line to the right.

Dealer "Priority Lists" are inflated by duplicate listings and wishful thinking.

Wartime consumer surveys give an inflated picture because the attitude of the prospective customer has changed since the surveys were conducted. To properly interpret the survey figures we must discount them for wishful thinking, dream modelitis and buying hesitancy due to unemployment, labor-management squabbles and O.P.A. ceilings."

So it seems to me we are back in the land of reality and in the climate where the sunshine of frequent victory is the more rewarding from the shadow of occasional defeat, and there may well be some sound and profitable steps to be taken by gas companies as they proceed to struggle for their full share of such business as may be available to all the mercantile interests of our country.

For one thing, it seems to me that the gas industry, as well as all the utilities and probably business generally, needs catharsis—and I don't mean epsom salts. Catharsis as I apprehend it is salutary discipline through actual or vicarious experience. For your uncultivated and profane ears, let me say that the prescription is for a complete reorientation, a total revision of the static method of doing and thinking into which war conditions have driven us. We must cast out this inertia, this willingness to avoid new opportunities, this eagerness to rest complacently upon the easy alibi that we have shortages of material, governmental restrictions or lack of manpower or womanpower that retard us in seeking more business or effecting economies or improving service.

We can't laugh off the job of repairing gas burning apparatus because repair parts are slow in delivery; we can't reject the order for new gas consuming equipment because the manufacturers are tied up by strikes; we can't refuse the extension of gas mains because of pipe shortage or lack of manpower or stringency of union hours; we can't defer the request for space heating because there is a fancy order against it emanating from Washington or we are short of works capacity; we can't postpone the opening of bottle necks in transmission mains or auxiliaries in the works because we want to spend the money somewhere else; we can't duck our advertising because we're oversold; we can't decline the requests for help in community activities because of wartime conditions; we can't ignore competition because the other fellow is also hard pressed; we just can't elude the opportunities and responsibilities of our job. For, unfortunately, such attitude is epidemic among us, ranging from smug complacency to outright glorification that the times permit and conditions condone a deliberate disinterest in progress. For this is a condition that is not confined to individuals or ranks, sections or departments of our companies. It is an inevitable resultant of operation under edict and its continuance spells dismal failure, if not ultimate extinction. And let anyone among us who is without guilt, cast the first stone.

In a greater way even, we need a wider concept in our management view of what we shall do in gas sales. For years we have been primarily on the defensive, trying to hold what we have, to replace diminishing sales in one category with small increases in another. Without attempting to belittle the excellent and conscientious efforts that have been made and are being made to hold or to increase the gas cooking load by developing more desire for home cooking and greater interest in the home through a streamlined kitchen, to secure some of the home refrigeration business, to enlarge water heater sales through programs for cleanliness, to reach for some of the commercial cooking load, I submit that we need to pass from a vigorous defensive to a militant offensive in load building.

Bear in mind our present efforts are too much like O.P.A. trying to hold a price line —and that line right now has more twists in it than the torso of a burlesque shimmier. Try as we will to hold, rebuild or extend cooking load we are faced with the fact that vigorous salesmanship will raise the family purchases of frozen foods from $5 to $250 a year and we lose gas sales when that happens. While we are plugging for refrigeration by gas, the distribution of electrically-operated machines that provide low temperature storage is expanding rapidly and leaving the gas refrigerator in second place. Don't forget that the oil man is coming back again to heat water and the electric man thinks he can do that job too. Lurking in the shadows and spying on our heating load is the fellow with the reverse cycle house heating.

Necessity Breeds Success

The gas industry has done a great and unparalleled job in the past few years. It has raised millions for research. If anyone had predicted such an action twenty or more years ago he would have been quietly and gently slipped into a straight jacket. Now it seems to me we need to do one more thing with some of this money or with our aroused spirit. We are doing a lot of talking, figuring, writing about the space heating business, asking whether we can embark upon it on a really large scale, whether it can be sold, whether it can be handled, whether it can be profitable in such a program. Isn't it time to take an example from the development of atomic fissure—that was a subject that was being toyed with prewar but when dire necessity put on the heat and the money was adequately provided, the success story could be written.

Perhaps we need to put the right people of our industry into a hideout and let them do nothing else but search for the answer of volume sales of gas. Then, if it can be done, let's go at it hammer and tongs; and if it can't be done, why not follow the fashionable trend of the day and stand in line for a Federal subsidy or give the business back to the Indians.

If I may make one more reference to the Scriptures, I surmise that we need to follow the precept of the Master coming upon his disciples at the end of a day of unproductive fishing on a Palestine sea and noting the direction of their fishing he said to them in effect, "Turn about in the boat, cast out into the deep." Haven't we been seeking minnows between ourselves and the shore when we need in this industry to turn about in the boat and fish in the deep and well-stocked waters?

Now, whether or no we are willing to play for large stakes, we must undertake the im-

Headliners at Hartford's Home Conference

Pictured at The Hartford Gas Company's annual Home Economics Conference are the principal speakers, left to right, seated: Treva E. Kauffman, chief, bureau of Home Economics Education, State of New York; Walter T. Clark, state director, production and marketing, U. S. Department of Agriculture; Elizabeth Sweeney, editor of household equipment, McCall's Magazine; and Jessie McQueen, home service Counsellor, American Gas Association. Standing is Mrs. Arra Sutton Mixter, home service director, in charge of the conference. About 200 persons attended the conference which included exhibits of model layouts of school homemaking department, a nutrition display, and New Freedom Gas Kitchens

mediate, broad and intensive education and development of our organization, whether they be in production, distribution, utilization, sales, commercial, accounting or whatever—and mostly we need to do it with those of our forces who deal directly and closely with our customers.

If you have not already done so I invite you to observe for yourself over a period of a few days or a week the deterioration that war has brought upon the mercantile and service trades of America. Look through the department stores; observe the lunch rooms, the bar rooms, the restaurants; keep your eyes and ears open on the railroad trains; try to make a telephone call that winds up anywhere near the place you ask for; look in on the grocery store, the shoe maker, the fruit stand; make note of the bus you ride in; remember what takes place in the automobile repair shop; try to get civil treatment in a governmental office and then when you have summarized the runs and hits and errors in those establishments, go ahead and kid yourself that your own gas company organization has come through unscathed, is functioning as smoothly and as brilliantly as it did prewar.

Kid *yourself*, I say, if you will, but don't ask me to take the same ostrich-like posture. I will be honest enough to say that my people are not the equal of yours—and through no fault of theirs. Simply through turnover, retirement, service in the armed forces, separation to work in war industries the people we had who were carefully and thoroughly trained in knowledge of the company and of the apparatus they were selling, in understanding the fundamentals of the business, comprehension in the manifold gymnastics of the customer mind, development of courtesy and kindness toward the public and fellow workers, in maintenance of loyalty to the company and its obligations, are in large numbers no longer with us.

So, after "The Amazing Interlude" of another world war, we return to the duties and tasks and privileges of a world at peace—where we put on again the binding circumstances of competition, we trade delivery under rationing for selling by sweat and we gain anew the full measure of satisfaction from our own endeavors. For over the shoulder the rainbow is a foggy, foggy dew, the pot of gold is a false and exploded goal but there is still ahead of us the pathway of believing greatly, trying boldly, serving splendidly—the road of opportunity and success.

Display Bulletin

THE Residential Gas Section of the American Gas Association recently published Display Bulletin, volume twenty-three, a compilation of store window and card displays. Fifteen pages of outstanding displays featured in the bulletin emphasize the importance of visual selling.

Robert M. Angell, New York Power & Light Corp., is chairman of the Window and Store Display Committee, which compiled the bulletin.

Home Service "Good Grooming" Lectures

Gene Lydick, Home Service Division, demonstrates that careful washing and rinsing with warm water of correct temperature, followed by a cold rinse, are essential in good complexion care

WHAT has Home Service to do with good grooming? A great deal, as the Home Service Division of the Equitable Gas Company, Pittsburgh, has been demonstrating in its lectures to school groups this year. For good grooming depends in large measure on plenty of hot water, believes Kathryn Barnes, director of the Home Service Division.

So far, 5,554 students have attended these 65 lecture-demonstrations, given in 35 schools in communities of Allegheny County served by the Equitable Gas Company. Ordinarily Home Service demonstrations are reserved for students in the Home Economics classes; but so important is a proper knowledge of good grooming, in the opinion of educators, that in many schools the demonstration has been staged in the school auditorium so that all the girls in the school may attend.

The dependence of good grooming on adequate hot water is a basic point which the Home Service representative stresses throughout her talk. Different types of gas water heaters are shown in full-size cut-out models, and their principle of operation is explained. The type of heater as well as the adequacy of hot water in their homes are matters of lively interest among the girls in the groups.

From a discussion on the availability of hot water, it is a natural step to telling of its importance to the girl herself. Since a good appearance depends first of all on good health, it is easy to explain briefly the use of hot water for cleanliness in the home, for keeping dishes and pans sterile, and for keeping clothes fresh and neat.

But the girls are anxious to learn about themselves—the irresistible lure of a "beauty talk"—so it is this phase of good grooming that is presented in great detail. To give vivid reality to the presentation, a previously arranged table holds soaps, shampoos, creams, powders, deodorants, manicure aids and other cosmetics, together with towels, bowls for water, thermometers and other equipment the demonstration needs.

Starting with personal cleanliness, the importance of hot water is self-evident for shampoos, manicures and daily baths.

Then a daily routine of right personal habits is carefully described. Are clothes clean, nicely pressed and brushed? Are white collars and cuffs, hair bows or flowers fresh and crisp? Are slips the right length, straps properly adjusted? Are hats and shoes well brushed?

For hair care, weekly or bi-weekly shampoos are recommended, along with daily brushing for a healthy, alive, well-cared-for look.

Hands, which are of such adolescent concern, must first of all be clean, then protected with a lotion or cream. How to file and shape the nails is carefully explained. Although colored polish is not advocated for school girls, since many do use it, its correct application and an unchipped look are stressed.

Complexion care is shown in step-by-step demonstration, with one of the girls serving as a model for a facial treatment. First the skin is carefully cleansed with an emollient cream, then washed with a milk soap and warm water. A thermometer is used to emphasize the temperature which is just right. After two rinses in first warm and then cold water, the skin is patted dry and a harmonizing face powder is lightly patted on. If it is evident that the group uses lipstick, the model's own lipstick is used to show its most effective application.

To serve as a personal check and to carry home the message of hot water, an attractively illustrated chart is distributed at the end of the lecture. In addition to a check list for self-rating on grooming personal appearance, the chart also lists proper water temperatures to suit various fabrics when washing clothes so that they do not shrink or fade but retain their color and good fit.

Industrial & Commercial Gas Section

HARRY A. SUTTON, Chairman | KARL EMMERLING, Vice-Chairman | MAHLON A. COMBS, Secretary

Sections Program Reviewed

Harry A. Sutton

AT a recent meeting of the Managing Committee, Industrial and Commercial Gas Section, American Gas Association, reports on the activities of the Section committees to date gave evidence that the objectives of the several committees are being realized. Chairman Harry A. Sutton reviewed events of interest to the members that had taken place since the previous meeting.

Among the events reviewed were A. G. A. participation in the National Metal Congress and Exposition at Cleveland, February 4 to 8, during which time the traditional Industrial Gas Breakfast was revived. At the National Restaurant Exposition, Chicago, March 26-28, the Section sponsored a Commercial Gas Cooking Center which was adjacent to the exhibits of a number of commercial cooking equipment manufacturers. The first postwar A. G. A. Sales Conference on Industrial and Commercial Gas was held in Toledo, March 29-30. It was at this conference that the Industrial and Commercial Hall of Flame was inaugurated, and the first certificates were awarded to 64 individuals. Mr. Sutton then called for the committee reports.

Food Service Equipment Committee

Leon Ourusoff, chairman of the Food Service Equipment Committee, stated that he had held a meeting of the subcommittee chairmen to inaugurate the program as outlined at the previous Managing Committee meeting. His report took the form of stating the progress these subcommittees had made.

Subcommittee on Sales Promotion

J. A. Rockefeller, chairman, is conducting a survey on promotional techniques being followed by gas companies to assemble the best features so that they will be available to those companies that do not have the facilities to organize promotional campaigns. The results so far have been very gratifying.

Considerable progress has been made in securing information on the use of scale models of commercial kitchen equipment for sales promotion. It is desired that full data be obtained on the costs and other practical problems before any formal announcement is made regarding the use of scale models in setting up kitchen lay-outs for prospective buyers of new equipment, rearrangement of kitchens, or for new jobs.

It was further suggested by Mr. Rockefeller that a promotional booklet be prepared for use in answering inquiries on advertisements and for distribution at national expositions.

Subcommittee on Appliance Upgrading

Harry B. Wilson, chairman, is following up recommendations of the predecessor subcommittee. Several major appliance manufacturers have replied to inquiries sent out, and it is indicated that the manufacturers are thinking seriously about the upgrading of their appliances.

This group made the following recommendations for research on commercial cooking equipment to the Committee on Industrial and Commercial Gas Research:

(1) Comparative tests of gas vs. electric equipment, the tests to proceed in the following order of preference—fryers, bake ovens, broilers, ranges, and then other equipment.

(2) Development of a deep fat fryer equal or better than competitive equipment.

(3) New methods of heat application to all commercial appliances with particular reference to forced combustion.

(4) Development of better counter appliances.

Subcommittee on Sales Training

Walter S. Anderson, chairman, reports that excellent progress is being made on the new book, Gas in the Commercial Kitchen (heretofore referred to as the Manual), and that it will be in shape for the printer sometime in September.

Plans for a Commercial Gas School were discussed and a tentative training program set up. Response from member companies has been gratifying, and enough interest has been aroused to assure the success of a training course. Inquiries are now being made in an effort to provide the best possible location for a school, and to set the most convenient time of the year to hold it. A report on this will be made later in the summer.

Committee on Heat Treating and Finishing with Gas

Charles C. Eeles, chairman, was called on next to give a report on his committee's activities. Mr. Eeles stated that the committee

Luncheon meeting of A. G. A. Industrial and Commercial Gas Section's Managing Committee at Atlantic City, N. J., May 2. Clockwise around outside of table: Leon Ourusoff (back to camera), Carl Wierum, Frank H. Trembly, Jr., D. A. Campbell, M. A. Combs, L. E. Biemiller, C. George Segeler, Harry A. Sutton, Charles C. Eeles, J. P. Leinroth, Karl Emmerling, F. T. Brooks, Emil Hofsoos, Paul Craig and W. Frank Roberts. Inside table: E. W. Mears, Roy E. Wright and C. H. Lekberg

had nine Information Letters under consideration, and that Letter No. 6 on the Kolene Process was ready for mailing. Letters number 7 to 11 were in the hands of the committee members for comment and criticism. Letters 12, 13 and 14 are in the formative stage and should be ready for distribution before the end of the Association year.

Tests which were on the program for early conclusion have been delayed by circumstances beyond the control of the committee. These were on tests of gas-fired convection vs. gas-fired infra red ovens, and tests on gas-fired tunnel burners vs. gas-fired radiant burners. It is hoped that these tests can be conducted during a period when the next committee meeting will be held so that the members may be present during a part of the tests.

Non-Ferrous Metals Committee

C. George Segeler, chairman, reported that certain projected work had been held up due to conditions beyond their control, but it was expected that they would proceed with the work within a reasonable time. However, the committee has been able to institute tests on two projects on which reports will be rendered as soon as they are completed.

The largest project being undertaken by the committee and one which will probably take a year to complete, is the laying out of a standard procedure for foundry operation. Mr. Segeler stated that foundries themselves requested that this work be undertaken and it will be a real contribution to foundry practices. This committee has three members from outside of the gas industry so that it is well integrated with actual practice.

The Gas Production Research Committee has been requested by this group to furnish them with all reports on the findings of the sulphur removal project. Some of the methods of sulphur removal may be suitable for use by individual plants even if it is too expensive for a gas company.

National Advertising Committee

J. P. Leinroth, chairman, Industrial and Commercial National Advertising Committee, reviewed the 1945-1946 advertising activities and told how the entire program had been stepped up to become the largest and most effective advertising program ever instituted by the Section. He then introduced the advertising agency representative who gave a preview of the presentation he would make to the A. G. A. National Advertising Committee for the 1946-1947 Association year. The recommendations covered practically the same program as the past year.

Industrial and Commercial Gas Plans

A PREVIEW of the Fall program of the Industrial and Commercial Gas Section, American Gas Association, promises a season of full activity according to an announcement by Harry A. Sutton, chairman. The first meetings following the vacation period will be held during the Association's annual convention in Atlantic City, N. J., the week of October 7.

The Industrial and Commercial Gas Section's part of the annual meeting begins with a luncheon in the Rose Room of the Hotel Traymore on Tuesday, October 8. A top-flight speaker will be on hand to address the guests, and it is hoped that all gas men, from the top down will avail themselves of this opportunity to meet with industrial and commercial gas men and hear a speaker who will have a message for everyone attending the convention. This is the only scheduled luncheon of the week.

Following the luncheon, an afternoon program has been prepared by Frank H. Trembly, Jr., and his committee that will be of vital interest to everybody in the gas industry. Pertinent and timely topics will be discussed by informed and outstanding speakers. All the luncheon guests are cordially invited to remain for this afternoon session where they will hear addresses having a direct bearing on situations in their home territories.

The Program Committee has also prepared an interesting program for the afternoon session on Thursday, October 10, when other leaders in the gas industry will hold discussions on subjects that will be of help to gas men in their everyday business problems.

Further events in the Section program of activities are the A. G. A. Combined Exhibits in National Expositions. The first of these will be the National Hotel Exposition, Grand Central Palace, New York City, November 11 to 14. The American Gas Association will have a combined exhibit there, and the preliminary sketches show a most attractive setting for the commercial gas cooking appliance manufacturers who have already signified their intention to co-sponsor the exhibit.

For industrial gas men, Atlantic City will be the scene of the National Metal Congress and Exposition in the Public Auditorium, November 18 to 22, where in the largest single exhibit area the American Gas Association and the leading manufacturers of industrial gas equipment will make up the A. G. A. Combined Industrial Gas Exhibit promoting the utilization of gas fuel in industry.

The last event in 1946 will be another A. G. A. Combined Exhibit at the National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, December 2 to 6. Here again leading manufacturers of gas-fired equipment will jointly sponsor a gas exhibit with the American Gas Association.

Participation in these national expositions really starts off the nation-wide activities of the Industrial and Commercial Gas Section after several years during which no shows were held. It is hoped that gas men will avail themselves of these opportunities to keep pace with the latest developments.

Two important dates to remember

Tuesday, October 8—Luncheon and Afternoon Session

Thursday, October 10—Afternoon Session

ROSE ROOM—HOTEL TRAYMORE—ATLANTIC CITY

Meeting of Program Committee of the Industrial and Commercial Gas Section at A. G. A. headquarters on June 7. Left to right seated: Charles C. Eeles, M. A. Combs, Frank H. Trembly, Jr., chairman, Program Committee, Carl Wierum and L. E. Biemiller. Standing: Chester A. Shear, Harry A. Sutton, Karl Emmerling, Leon Ourusoff, Frederick O. Hess and John Huston

Midwest Industrial Meeting Planned

GEORGE HATHWAY, vice-chairman of the Midwest Industrial Gas Council, reports that an interesting program is in the making for the Minneapolis meeting, September 12 and 13.

The two morning sessions will be devoted to papers and the afternoons to inspection trips. While all the details have not been completed, Eugene D. Milener, coordinator of general research, American Gas Association, will present a talk on "Industrial Gas Progress Through Research."

On the Job with Industrial Maintenance

BY CARL WIERUM

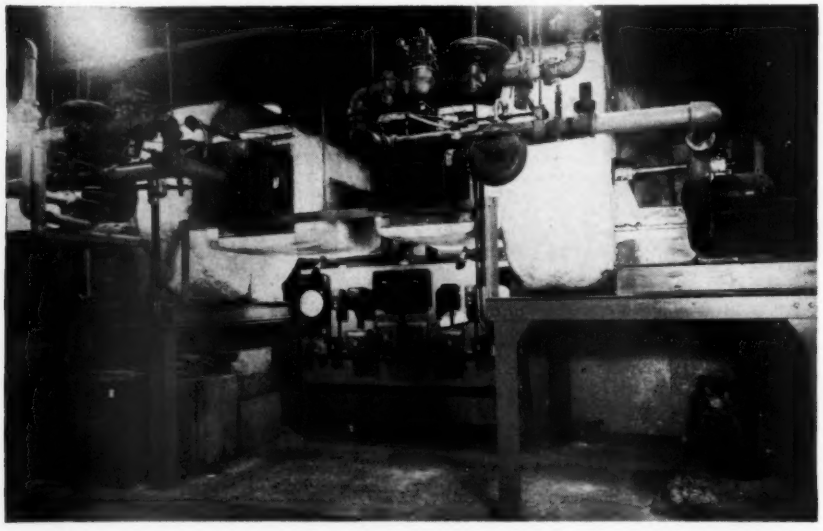
Industrial Sales Manager, The Brooklyn Union Gas Co., Brooklyn, N. Y.

THE Industrial Maintenance Group of The Brooklyn Union Gas Company is an integral part of the Industrial Sales Section and consists of a supervisor and eight men. The importance of its work often tends to be overlooked when contrasted with the sometimes more interesting sales work.

The objectives of this group are basically the same as those of the Customers' Service Department. It endeavors to aid sales and maintain existing load through careful and efficient handling of service calls. It is our firm policy to keep promises; that is, to get to the job at the time set and to have our men so trained that they can accomplish what they are sent out to do.

Reprinted from *The Brooklyn Union Gas News.*

Front view of two large core baking ovens of the truck loading type. They are heated by an externally located air heater, automatically controlled



Rear view of the ovens shown above. This contrasting view showing the air heaters with all safety and temperature controls reveals the complicated problems maintenance men must solve. They must have a thorough understanding of the operation and control of this type of installation

On new installations, we work in close cooperation with equipment manufacturers' representatives, in some cases, as I shall show later, acting for them in an emergency. We also assume considerable responsibility in supervising an installation and in instructing and training the customer's maintenance men and operators in the use of new equipment.

A secondary function of this group is to provide a training school for prospective salesmen. Most of our men served an apprenticeship with the maintenance group and, through that experience, have acquired a working knowledge of industrial equipment essential to a real understanding of it.

A brief word as to how this section operates: Requests for service come from three sources, (1) the industrial salesmen, (2) telephone calls from customers and (3) calls which the Customers' Service Department send to us from the shop. In any case, a ticket is made out in duplicate and each morning the men are given assignments.

When a job is completed, a report is made out on the back of the original which is sent to the originator of the call. The copy is filed for future reference. A log book is also kept of service calls rendered, with the date of start and date of completion of the job.

We are usually able to get out on a complaint the day after it is received; in an emergency we can get there the same day, as the men call in frequently. We are not always able to complete the job the same day, however, but in that event, we do not leave until definite arrangements are made to finish the next day.

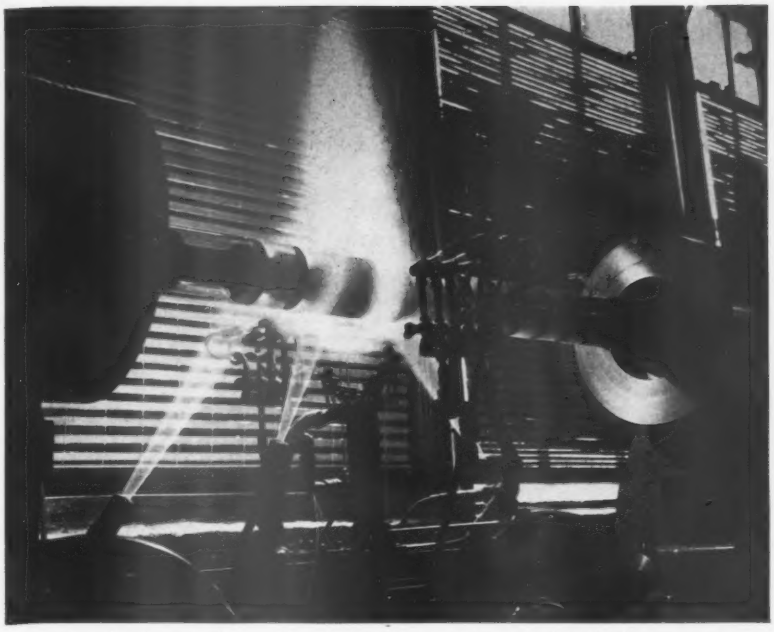
The Industrial Maintenance Group also handles certain types of commercial service work, such as service on tailor boilers and sidewalk bakeries.

Our service problem is rather complex. There are more than 4,000 industrial customers. They range in size from the Brooklyn Navy Yard which had an average wartime consumption of 25,000M cubic feet monthly down to small sheet metal shops with a bench solder stove. In between are every conceivable type of business and demand. There are numberless ways in which gas is required by industry.

The industrial serviceman must have a working familiarity with all equipment on our lines, including the domestic. He must thoroughly understand all combustion systems and their adjustment. In addition to the well-known atmospheric burner type of combustion, he deals with high pressure gas, gas-air two-valve systems, gas-air one-valve (automatic proportioning), and systems using premixers.

In order to give some concrete examples of industrial service and to illustrate particularly

(Continued on page 358)



View of world's largest glass-working lathe used in production of high-voltage X-ray tubes. Flames from three gas burners converge on a section of a one-million-volt tube to preheat it before the hydrogen sealing flames are turned on

Gas Heat-Treats Giant X-ray Tubes

THE world's largest glass-working lathe, weighing two tons, is in operation at the Chicago plant of the General Electric X-ray Corporation, and is used in the assembly operations of one million and two million volt x-ray tubes. The lathe is 9 feet between chucks. A piece of glass 84 inches long can be worked, and tubes which will pass through the spindles are limited to length only by the size of the room.

In the field of vacuum tubes, those of the x-ray type form only a very small part of the total production and consequently are manufactured on a small volume basis. The one and two million volt tubes for which this lathe was designed are generally used for industrial applications and were employed extensively during the war to determine flaws and weak spots in critical castings for airplane superchargers and similar material. They also proved invaluable to the inspectors in shell loading plants where both sizes of the super-voltage tubes were used.

While city gas does not play a major role in the fabrication of these giant 24-section glass x-ray tubes, it does have a most important function. Cylindrical glass sections are sealed to Fernico metal rings which join the sections together and serve as a bond between the metal intermediate electrode supports and the glass. Fernico metal rings, a cobalt-nickel-iron alloy is used because it has a coefficient of expansion approximately that of the glass which is a boro-silicate or Pyrex glass.

In assembling the glass sections and metal rings in the lathe, all glass of this type must be pre-heated to a precise temperature before the actual working flames can be applied. Again after the real high temperature work has been completed, the glass must be cooled gradually to a temperature of about 400° C. to relieve all strains set up in the working process. The only suitable flame found for this part of the work, pre-heating and annealing, has been city gas.

When the glass has been properly preheated, the cylindrical glass sections of the tubes are sealed by hydrogen and oxygen flames to the Fernico rings. A high frequency current is passed through the flames to heat and seal the glass more effectively.

In making a glass-to-metal seal, time and temperature control is a prime factor, and a reduction in the time required to reach the desired temperature is more readily attained with hydrogen. Pyrex glass must be worked at 1400-1500° C. to obtain best results. For the pre-heating and annealing processes, the burners used are the nozzle mixing type and may be adjusted from the main control panel or from foot pedals. They have an input of approximately 450,000 B.t.u.'s per hour. This type of burner was especially designed by engineers of The Peoples Gas Light and Coke Company for this largest glass-working lathe.

INFLATION: A fate worse than debt.
—ROD MACLEAN in the
Saturday Evening Post

gas grapevine

dr. george b. waterhouse, past president, american society for metals, and professor emeritus, m.i.t., who was a speaker at the last industrial gas breakfast in cleveland, was selected to deliver the first hatfield memorial lecture before the may meeting of the british iron and steel institute. the lecture is sponsored jointly by the iron and steel institute, the royal society and the university of sheffield.

---

poor little old magnesium is getting an awful kicking around in postwar products. now it has gone strictly feminine, being made into m'lady's compacts, according to a recent issue of modern metals. then to the other extreme, wholly masculine and right up the alley of stevedores and freight handlers—dock boards.

---

cooking for profit, that commercial gas publication is making good use of a. g. a. commercial cooking advertisement illustrations to give additional publicity to eating establishments using gas cooking equipment. see our section preprints issued monthly for advertisements your company might use locally. mats are available.

---

while doing a publicity story on the manufacture of a popular electric razor, with special emphasis on the many heat-treating operations involved, all gas-fired of course, the office wag suggested a title for it—skin recovery!

---

our section program for the a. g. a. annual meeting in atlantic city is shaping up very nicely. ye scribe eavesdropped at frank trembly's committee meeting the other day and heard all about the comprehensive program that is being prepared. it really is something that no gas man should miss. come early and hear the outstanding speaker who will start off our sessions at the tuesday luncheon, october 8.

---

hardly a month goes by without the brooklyn union gas boys coming up with something good. this time it's carl wierum, industrial sales manager, who has a swell program for industrial maintenance. read the whole article in this issue.

---

miss margaret crozier's informative paper given by her at the a. g. a. conference in toledo last march was so well received by "institutions" magazine, that they got additional information and blew it up to an attractive double spread article with fine photographs of philadelphia school cafeterias. it's in the june issue, and really worth a look.

a. q. s.

Technical Section

LESTER J. ECK, Chairman | C. S. GOLDSMITH, Vice-Chairman | A. GORDON KING, Secretary

Production and Chemical Conference

THAT the gas industry is leaving no stone unturned to develop more efficient and even radically different gas-making processes was abundantly apparent at the annual Joint Production and Chemical Committee Conference which was held at the Hotel Pennsylvania, New York, June 3-5. The projected plans and results to date of the most intensive and best-organized gas production research program ever undertaken by the industry were laid before the more than 500 delegates who participated. Able speakers canvassed both American and European practice with the result that a large amount of useful data were presented.

Dr. Channing W. Wilson, chairman of the Chemical Committee, and R. Van Vliet, chairman of the Gas Production Committee, were the presiding officers at the conference which is sponsored annually by the Technical Section. The cooperative research studies were introduced by Hudson W. Reed, chairman of the Manufactured Gas Department, and president of the Philadelphia Gas Works Co., who is also a vice-president of the Association.

While the spotlight was on gas production research, chemical developments and the increasing use and significance of liquefied petroleum gases were very much in the limelight. An entire symposium was devoted to the latter subject.

As in the past, the informal off-the-record luncheon sessions attracted large crowds and provided the answers to many questions. These were held on Tuesday afternoon as follows: Carbonization and Coke—Elliott Preston, Koppers Co., Pittsburgh, chairman, and W. C. Wardner, Connecticut Coke Co., New Haven, alternate chairman; Chemistry in Industry—H. A. Lockhart, Haverhill Gas Co., Haverill, Mass., chairman; High B.t.u. Gas—C. L. Hulswit, Rockland Gas Co., Spring Valley, N. Y., chairman, and G. J. McKinnon, Michigan Consolidated Gas Co., Detroit, alternate chairman; Water Gas Operation—P. T. Dashiell, The Philadelphia Gas Works Co., chairman, and J. V. Postles, of the same company, alternate chairman.

President Everett J. Boothby, who is vice-president and general manager, Washington Gas Light Co., struck the keynote in his opening address when he said America faces an industrial renaissance in which scientific achievement will find no parallel in all history. "Operating men, no matter how efficiently and economically they are doing a job today, must aggressively challenge the presently accepted equipment and processes," he said. In conclusion he admonished the gas men to "set your sights on an ever broader and higher scale!"

Gas production is undergoing a metamorphosis based on the realization that the gas industry is a chemical industry, H. Carl

Dr. A. W. Gauger, State College, Pa.; Dr. F. E. Vandaveer, Cleveland; R. Van Vliet, chairman, Gas Production Committee, Staten Isand; F. B. Parke, Brooklyn; Dr. Channing W. Wilson, chairman, Chemical Committee, Baltimore; and W. R. Fraser, Detroit

Dinner meeting of Technical Section's Managing Committee held at the Hotel Pennsylvania during the Production and Chemical Conference. Lester J. Eck of Minneapolis, chairman of the Section, led the discussion of the Section's program and activities

Delegation from Chicago. S. J. Modzikowski, E. W. Andrews, J. B. Craven, H. J. Wiedenbeck, W. W. Mellett and W. H. Isaacs, all from The Peoples Gas Light & Coke Company

E. J. Boothby, president, American Gas Association

F. W. Hartzel, Philadelphia; C. B. Glover, Philadelphia; A. S. Budd, Philadelphia; J. W. Richards, Newark; R. S. Emanuel, Harrison, N. J.; and J. Hawley Tausstg, Philadelphia

. Peables, Pawtucket, and E. L. Murphy, Brooklyn

J. T. Stone, New Orleans, and T. H. Kendall, Pittsburgh

G. T. Bentley, Detroit and Dr. E. W. Guernsey, Baltimore

Knowlton, Providence and C. S. Goldsmith, Brooklyn

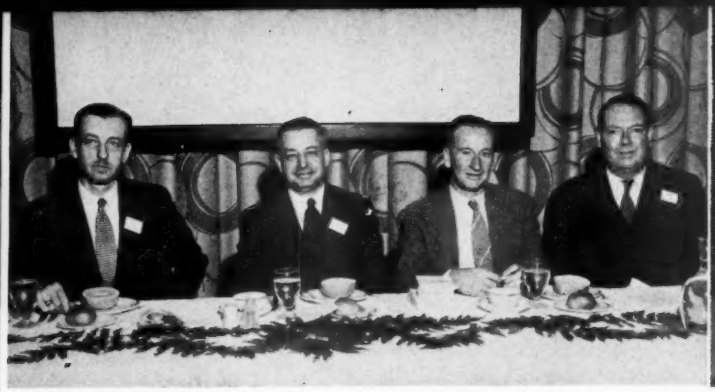
A. D. Harrison, Brooklyn; M. J. Harper, New York; and A. S. Hall, Springfield, Mass.

Louis Shnidman, Rochester; A. C. Sedlachek, Philadelphia; and A. E. Robertson, Cincinnati

Hall M. Henry, Cambridge; E. S. Wilson, Newport, R. I.; and Edwin R. Clark, Lynn, Mass.

B. P. Mulcahy, Indianapolis; E. M. Bliss, Harrison, N. J.; and T. M. Gilbert, New York

Sam Green, vice-chairman, Gas Production Committee, Brooklyn



Speakers' table at the "Chemistry in the Gas Industry" luncheon conference. C. W. Wilson, Baltimore; H. A. Lockhart, Haverhill, Mass., chairman; W. R. Fraser, Detroit; and R. F. Tenney, Mineola, N. Y.

L. L. Newman, chair., Subcom... of Oxygen in Gas Man... E. S. ...opean

Wolf, managing director, American Gas Association, told the conference. The industry is further exploring ways of converting solid and liquid raw materials to gas and of capturing chemical by-products both in gas manufacture and in the utilization of natural gas, he said. Such a program, Mr. Wolf continued, involves both men and materials which means emphasis on research, personnel training and selection.

S. P. Cauley of the Socony-Vacuum Oil Co., New York, in the first technical paper reviewed various methods of estimating the enriching value of oils on the basis of physical properties. His illustrated remarks added to information on the same subject which appeared in the November, 1945, A. G. A. MONTHLY under the joint authorship with E. B. Delgass. It is the author's opinion that actual cracking tests are required to give the real value of an enriching oil.

Methods of producing coal for manufactured gas production were described with the aid of slides by H. F. Hebley, Pittsburgh Coal Co., Pittsburgh. He advised the gas industry to modify its operations because of the coal operators' inability to remove all impurity from coal except at prohibitive cost and because of the depletion of highest quality gas coal deposits.

Continuing a study of water gas set capacity presented by George R. Steere at the 1945 Production and Chemical Conference, F. W. Hartzel, United Engineers and Constructors, Inc., Philadelphia, summarized the results of a new report by Mr. Steere consisting of data from 15 plants.

Mr. Hartzel pointed out that in all cases where increased capacity was obtained, the results were accomplished by increasing the throughput of raw materials. No one at this time, he said, can say with much certainty what the ultimate capacity of a water gas set is, because some of the limiting factors are not operative at ordinary rates and are seemingly unpredictable without large scale experimentation. Nevertheless, he added, it is apparent that the average gas plant is far from what might be termed ultimate capacity in the sense that maximum throughput has not been attempted or desired. He described as an outstanding accomplishment the endeavor reported in the December 1945, A. G. A. MONTHLY by P. T. Dashiell.

Development of increased set capacities, Mr. Hartzel continued, has generally accentuated bottlenecks in the external plant such as insufficient capacities in the mains, condensers, gas pumping, holders, purification, transmission and steam production. Much of Mr. Steere's new material has to do with these external limitations, he said.

The Monday morning session concluded with a review of developments in tar dehydration by subcommittee chairman J. G. Sweeney of The Brooklyn Union Gas Company.

Of particular interest to chemists, a report on the preparation and properties of indene and coumarone by Drs. J. N. Breston and A. W. Gauger of The Pennsylvania State College, presented by the latter, was the opening feature of the afternoon session. Since the physical properties of these parent plastics materials as previously reported in the literature showed little agreement, the authors made a careful study and reported their findings at this conference.

LP Gas Symposium

The major portion of this session was devoted to a symposium on liquefied petroleum gases which have become increasingly important in meeting peak-load requirements. Opening this phase of the program, R. E. Schneiter, Consolidated Edison Co. of New York Inc., described his company's appliance testing program to determine the interchangeability of various gases and their performance in burners. Following installation of a 10 million-cu.-ft.-per-day-capacity propane-air gas plant and other projected developments, Consolidated Edison installed an elaborate testing plant, which Mr. Schneiter described, and invited the delegates to visit.

An interesting illustrated discussion of LP gas plant and distribution practice was presented by B. P. Mulcahy, Citizens Gas and Coke Utility, Indianapolis, whose company has operated a 75,000-gallon propane plant since November 1943. Undiluted propane gas is used for cold enriching water gas or to increase the B.t.u. in city gas to compensate for high specific gravity. Two McKee proportioners will produce five million cubic feet per day of 570 B.t.u. propane-air gas in emergencies. Mr. Mulcahy observed that propane equipment is flexible, easy to handle and offers little difficulty.

Operation of the LP gas installation at the West Conshohocken Plant of the Philadelphia Electric Co., was discussed by E. G. Boyer, manager of gas operations of that company. His report, which includes valuable data on utilitization of LP gases for cold enriching of standard gases, and for production of peak-load mixtures and distribution capacities, is included in full in this issue of the MONTHLY.

Commenting on the relative advantages of reforming LP gas and heavy oils, C. B. Glover, United Engineers and Constructors, Inc., Philadelphia, said that factors vary so greatly in individual plants that it is impossible to generalize. He reviewed recent examples of peak-load operations and indicated

John H. Wolfe, Baltimore, Md.

H. K. Seeley, Syracuse; P. T. Dashiell, Philadelphia; Col. Hudson W. Reed, Philadelphia; and Edwin L. Hall, New York

H. K. Seeley, Syracuse; Gordon G. Howie, Can... J. P... and H...

E. S. Pettyjohn, who spoke on "European Gasification Processes"

F. J. Pfluke, Rochester; C. C. Russell, Kearney, N. J.; Elliott Preston, Pittsburgh; W. C. Wardner, New Haven; and A. C. Sedlachek, Philadelphia

J. A. Benn, London, England

that the water gas set remains the principal producing apparatus due to its flexibility and its ability to use a wide range of raw materials.

Captain E. S. Pettyjohn, U.S.N.R., director, Institute of Gas Technology, Chicago, the session's concluding speaker, held the close attention of his audience with a detailed description of European gasification processes. He also presented slides showing the effects of the strategic bombing of German synthetic liquid fuel plants.

With one exception, the entire Tuesday morning session was devoted to organized cooperative research projects of the American Gas Association, thus spotlighting the unprecedented efforts being exerted to find better ways of making and utilizing gas. This session was introduced by Hudson W. Reed, chairman, Manufactured Gas Department and president, The Philadelphia Gas Works Co., who presided throughout.

Dr. E. W. Guernsey, chairman of the permanent subcommittee on organic sulfur, Consolidated Gas Electric Light and Power Co. of Baltimore, outlined the sulfur research plan, emphasizing that the first objective was to develop reliable tests for sulfur compounds in order to evaluate removal processes that may be developed later. He then introduced H. Hakewill who is in charge of this investigation at the Institute of Gas Technology, Chicago, who presented a paper prepared jointly with E. M. Rueck of the Institute.

With the aid of slides, Mr. Hakewill showed how the sulfur-testing apparatus was constructed and operated. Both he and Dr. Guernsey urged gas companies to use this apparatus if possible in their own laboratories. The test is designed to use one cubic foot of gas when the sulfur in the gas varies between one and ten grains of sulfur compounds per 100 cubic feet. The complete report, entitled "Tentative Procedures for Determining Individual Organic Sulfur Compounds in Gas," will appear in an early issue of the MONTHLY.

W. R. Fraser, chairman of the advisory committee on mixed gas research which supervised the preparation of Bulletin No. 36 "The Interchangeability of Other Fuel Gases with Natural Gases," described problems incurred in this work. He selected a gas-mixing problem and showed how a solution was reached by means of the method prescribed in the bulletin, emphasizing that the individual operator's judgment is necessary to reach a satisfactory solution.

Gas Production Research

Introducing the discussion of the gas production research program, P. T. Dashiell, chairman of the Gas Production Research Committee and vice-president, The Philadelphia Gas Works Co., pointed out that the principal effort of the committee since it was organized in October 1944 has been the development of a simple method for the production of peak-load gas which would be more economical in investment cost than present-day conventional methods. This problem has been approached from two angles: First, laboratory investigation of various methods of using available raw materials to reach the objective, and, Second, development of maximum efficiency and maximum production capacity of present equipment. While substantial progress has been made, he reported no new process to replace present methods is on the immediate horizon, consequently he urged operators not to wait for new processes but to get the most out of present equipment.

Mr. Dashiell then gave a point-by-point review of the general program and introduced members of the Gas Production Research Committee and the Technical Advisory Committee, who discussed specific projects.

E. G. Boyer, Philadelphia Electric Co.,

A. Gordon King, Secretary, Technical Section and Secretary, Manufactured Gas Department

spoke on the catalytic reforming processes used for reforming hydrocarbon gases and the I.G.T. work in developing new catalysts for this process. He also discussed the reforming of hydrocarbon gases in standard or modified water gas sets and referred to the work reported in the April 1946 A. G. A. MONTHLY.

E. J. Murphy, The Brooklyn Union Gas Co., described various catalytic processes now under investigation including the development of sulfur resistant catalysts and cata-

J. Patterson, Lowell, Mass.; and H. C. Jones, Boston

H. C. Jones, Boston; Everett Wilson, Newport, R. I.; E. G. Rhodes, New Britain, Conn.; and J. A. King, Perth Amboy, N. J.

H. F. Hebley, Pittsburgh, Pa.

C. L. Hulswit, Spring Valley, N. Y.; J. V. G. Postles, Philadelphia; and G. J. McKinnon, Detroit

F. H. Reed, Urbana, Ill.; D. A. Reynolds, Pittsburgh; and J. D. Davis, Pittsburgh

lysts for converting carbon monoxide to hydrogen. Details of the investigation of properties of water gas tar at the Pennsylvania State College under the direction of Dr. A. W. Gauger, were presented.

Fundamental studies of water gas reactions sponsored by the Gas Production Research Committee at I.G.T. and Battelle Memorial Institute were discussed by Dr. Wilson.

F. J. Pfluke, chairman of the Technical Advisory Committee, Rochester Gas and Electric Corp., told the conference about other production research projects including the flash pulverization of coal and coke. Possibilities of developing a fluid gasification process that might be applied to oil or coal were mentioned.

At the end of this session a motion picture illustrating flotation painting of water-seal gas holders was shown through the courtesy of Consolidated Edison Co. of New York, Inc. This procedure was described in the May, 1946, A. G. A. MONTHLY.

Tuesday afternoon was devoted to round-table luncheon conferences. The Wednesday morning meeting opened with the showing of a sound slide film by Dowell Incorporated illustrating a chemical method of cleaning equipment.

Results of jointly-sponsored U. S. Bureau of Mines-American Gas Association tests to determine the blending properties of low and medium volatile coals were presented in an illustrated paper by J. D. Davis and D. A. Reynolds of the Bureau, which Mr. Davis delivered. It was brought out that the average coking power of medium-volatile coals approximately equalled that of low-volatile coals and that this equality held true if the coals were carbonized separately or as blends with Pittsburgh coal.

Various methods of combating corrosion difficulties in underground structures of gas plants were analyzed by Charles F. Meyerherm, president, Albert F. Ganz, Inc., New York. He pointed out that no two corrosion problems are alike, consequently no one method of corrosion mitigation can be a cure-all. His informative paper covered protective coatings and cathodic protection, and cited remedial measures in a recent serious gas works corrosion failure.

L. L. Newman, chairman of the Subcommittee on the Use of Oxygen in Gas Manufacture, and chief, Foreign Synthetic Fuels Division, Office of Synthetic Liquid Fuels, Bureau of Mines, Washington, D. C., gave a progress report of his committee's activities and presented a valuable paper on "Oxygen Production and Utilization in Gas-Making Processes." The latter will be published in an early issue of the A. G. A. MONTHLY.

Reporting for the subcommittee, Mr. Newman referred to the work at I.G.T. concerning which four progress reports have already been submitted to the Gas Production Research Committee. From material gathered, Mr. Newman drew the following conclusions:

1. The technical phase of gasification of fuel with oxygen will be solved with perhaps no greater difficulty than was encountered in converting from gas oil to heavy oil for carburetion.
2. Gas produced by use of oxygen must be considered as a base load proposition.
3. Gas produced by the use of solid fuel and oxygen will have to be enriched.
4. Oxygen costs will be low enough to justify its use in gasification.

A paper by E. G. Hammerschmidt, Texoma Natural Gas Co., Fritch, Texas, entitled "Equilibrium Water Vapor Content of Compressed Gases," containing a useful chart, was distributed to the conference. Mr. Hammerschmidt points out that the actual water vapor content of saturated compressed gases is larger than is calculated by the usual method in which temperature effects alone are considered and in which the volume is calculated by means of the laws of a perfect gas. Using data published by various investigators, Mr. Hammerschmidt prepared a utilitarian chart that covers a broader range in temperature and pressure condition than has heretofore been generally available. In addition to copies of the paper, large scale reproductions of the chart may be obtained from A. G. A. headquarters.

High B.t.u. Gas Report

The final session, Wednesday afternoon, began with a report of the Subcommittee on High B.t.u. Gas by the chairman, G. T. Bentley, Michigan Consolidated Gas Co., Detroit, in which present-day practice and trends in standby gas production were brought up to date. Data compiled from an extensive survey by the 1944 committee was added to the report distributed to delegates so that operators would have complete information.

A marked trend toward the use of LP gas-air mixtures was reported by Mr. Bentley, who pointed out that the installed production capacity of LP gas for peak-load control in 1945 was about 2½ times greater than in 1943. However, the greatest volume in both capacity and production is still the modified water gas process using solid generator fuel.

Methods of testing bulk density in coke ovens and the relations between test values and the average bulk densities in commercial coke ovens were reported in a paper by H. S. Auvil, L. D. Schmidt and H. G. Graham of the U. S. Bureau of Mines, Washington, D. C. The result of investigations undertaken during the war, the report covers general aspects of bulk-density control, character of coals studied, testing methods, and relation between results of tests and full-scale oven operations.

Partial devolatization of coal by the fluidization process was described with the aid of a film by Dr. A. D. Singh of the Institute of Gas Technology. Further studies are in process with the object of determining the quality and quantity of by-products and the degree of desulfurization of the raw coal obtainable during its partial de-

Conference Papers

BOUND sets of the papers presented at the Conferences of the Technical Section, held April 15-16-17, and June 3-4-5, are being made available at actual cost of reproduction and binding, as follows:

DISTRIBUTION CONFERENCE and MOTOR VEHICLE CONFERENCE PAPERS

in one bound volume at $2.00 a set

•

JOINT PRODUCTION AND CHEMICAL COMMITTEE CONFERENCE PAPERS

in one bound volume at $2.00 a set

Send Your Order to A. G. A. Headquarters Now!

Wanted: Governors

THE Springfield Gas Light Co., is trying to locate any quantity of high pressure house governors—1" inlet and outlet. If anyone has governors of this type, or knows where they may be obtained, will he please communicate with S. J. Kennedy, Purchasing Agent, Springfield Gas Light Co., Springfield 2, Mass.

volatilization. Studies are also underway on coke production in a slot-type experimental oven from mixtures of char and coal, Dr. Singh said.

Summaries of activities of Subcommittees D-3 on Gaseous Fuels and D-16 on Industrial Aromatic Hydrocarbons of the American Society for Testing Materials, prepared by the chairmen, Dr. Gauger and V. J. Altieri of Eastern Gas and Fuel Associates, Everett, Mass., respectively, were read by Mr. Frazer.

The final feature of an information-packed conference was an illustrated report on German carbonization practices by Dr. W. C. Rueckel, Koppers Co., New York. Discussing the Ruhr, Saar and upper Silesia, Dr. Rueckel said that most of the carbonization equipment was comprehensive and old, adding that the Germans found it possible to operate these ovens under conditions that would be uneconomical in the United States. There are some new ovens, he continued, that incorporate the under-jet-fired principle and have self-sealing doors. Valuable detail was contained in Dr. Rueckel's presentation.

"Underground Corrosion" Book Published

THE National Bureau of Standards of the U. S. Department of Commerce has announced the publication of the book, "Underground Corrosion," by Kirk H. Logan, listed as Circular of the Bureau of Standards C450. This 312-page book is an assembly of the results of the Bureau's investigations of underground corrosion which began in 1922.

The results of the tests of ferrous materials given in this book indicate that the commonly used ferrous pipe materials do not differ greatly in their resistance to soils and that their apparent relative merits are either accidental or dependent on soil conditions. Low-alloy ferrous materials lose weight more slowly than unalloyed ferrous materials, but are penetrated by corrosion as rapidly. Alloys high in nickel and chromium are very resistant to corrosion.

In most of the soils investigated the rate of corrosion of ferrous materials decreases as the exposure is prolonged. Any rate of corrosion, according to the book, is applicable only to the area of the metal tested and the time it was exposed. The life of a pipe cannot be predicted solely from the loss of weight or the depth of a pit at any given time. The corrosiveness of the soil can be indicated only by a formula which takes account of the characteristics of the soil to which the pipe is exposed, the change in the rate of corrosion with time and the area of the exposed metal.

The book points out that the effectiveness of metallic coatings depends on the soils to which they are exposed, and that no metallic coating is suitable for all soils. The results of tests of a number of promising coatings developed in the laboratory are presented.

Several methods of testing soils and coatings are described and their usefulness discussed. The effectiveness of several methods of preventing corrosion are compared. Cathodic protection can retard or prevent corrosion under most soil conditions. The book describes methods of applying cathodic protection under several conditions. Details of test methods and apparatus are given in six appendices.

Copies of the Circular of the Bureau of Standards C450, may be obtained from the Superintendent of Documents, Washington 25, D. C., at $1.25 each.

"Wrinkles" Report Gives Short-Cuts

THE Technical Section of the American Gas Association has just published a 68-page booklet containing a valuable collection of operating "wrinkles" and short-cuts covering virtually every phase of the gas industry.

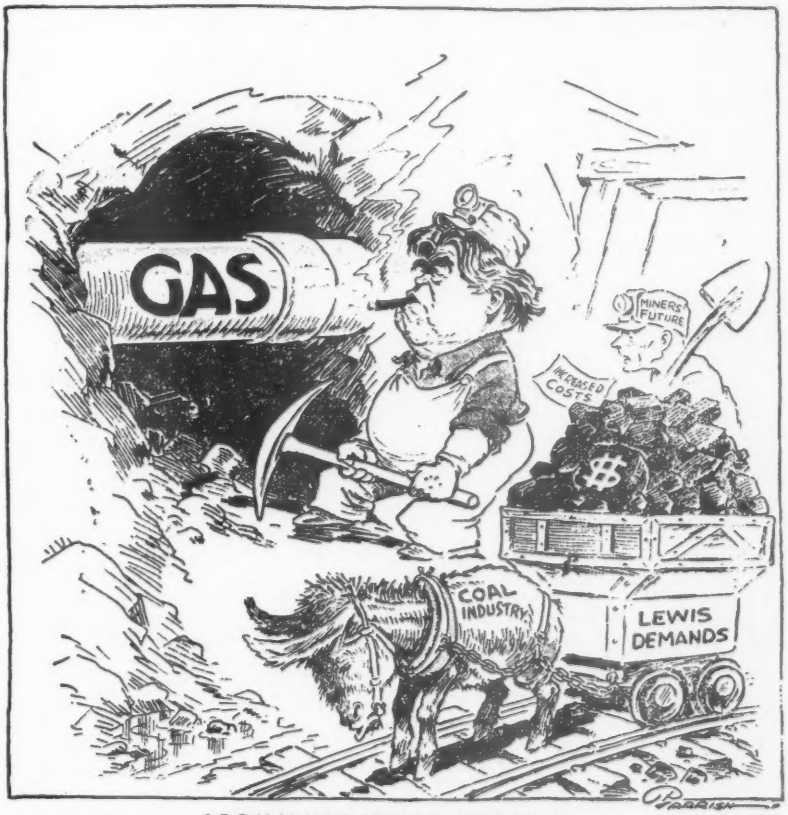
Collected by the Subcommitee on "Wrinkles," J. Gordon Sweeney, The Brooklyn Union Gas Co., chairman, the report is classified under the following eleven separate headings: gas plant equipment, distribution, odorization, meter and regulator repair, gas appliances, laboratory, instruments, fire protection, natural gas production, transportation, and tools.

Copies may be obtained at American Gas Association, 420 Lexington Avenue, New York 17, N. Y. at $.50 each for members, and $.75 each for non-members.

Chemical Show

THE fourth National Chemical Exposition will be held in Chicago, Sept. 10-14, at the Coliseum at the same time as the semi-annual meeting of the American Chemical Society.

Reprinted from Washington Times-Herald



LOOK WHAT JOHN L. DUG INTO!

Obituary

IVAR LUNDGAARD, for many years manager of the Industiral Department of the Rochester Gas and Electric Corporation, died suddenly at his home in Rochester, N. Y. on June 6. He was 64 years old.

Mr. Lundgaard was active for many years in American Gas Association affairs, and at the time of his death was a member of the Committee on Industrial and Commercial Gas Research, the Managing Committee of the Industrial and Commercial Gas Section, and Food Service Equipment Committee. He was chairman of the Program Committee for the 1944 Conference on Industrial and Commercial Gas, one of the most successful such meetings ever held. At the end of this Association year, he was slated to become a member of the Industrial and Commercial Hall of Flame.

A native of Norway, Mr. Lundgaard studied in Norwegian technical schools and qualified as a graduate mechanical engineer.

He came to the United States in 1904 and, after working in several other cities, went to Rochester in 1909 as a designing engineer for the R. G. & E. Successively he held positions of associate engineer, assistant industrial engineer and industrial engineer until 1915 when he was made manager of the newly formed industrial sales and engineering department.

In 1921 he left Rochester to go to work for the Hartford Refrigerator Company and later at Devon Manufacturing Company at Brighton, Mass. He returned to Rochester in 1930.

Ivar Lungaard

W. F. (SAM) NORTON died at his home in Nashua, N. H., on June 5. He was a prominent member of the New England Gas Association and upon his retirement in 1944 was elected an honorary life member. He was treasurer of the Guild of Gas Managers for many years and in 1920-1921 was president of the New England Association of Gas Engineers, an N. E. G. A. predecessor organization.

N. W. GIFFORD, Cambridge, Mass., died in June. He was associated with the East Boston Gas Co., which later merged with Boston Consolidated Gas Co., from which he was retired in 1928 as general manager of the East Boston Division. He was also secretary of the New England Association of Gas Engineers for twenty-one years, from 1899 to 1920, and an honorary life member of N. E. G. A.

A CUSTOMER SERVICE POLICY

(Continued from page 338)

and satisfaction. Our Customer Service Policy therefore will include free adjustment and repair service to domestic appliances and equipment to insure efficient *and* satisfactory usage.

Appliance sales are simply a means to the end of increasing the use of the products we sell. Our activity in this field will be focused on the maintenance of standards of appliance quality and dealer integrity which will ultimately further the use of our service, thereby increasing sales. We shall have a comprehensive plan which among other qualities will take the dealers into our confidence and convince them that what benefits us benefits them.

Sound dealer relations will be fostered directly by providing facilities, free of charge, where dealers and their service and installation men may receive ample training in the best methods of installing and servicing equipment. We will let it be known that cooperative dealers—those who are willing to maintain a high standard of service and installation work—may be placed on our approved dealer lists. These will be given the benefit of our referrals when customers come to us for advice and counsel. Legitimate dealers will thus be encouraged to maintain standards in selling, installing and servicing which will insure customer satisfaction and avoid complaints.

Summary

There is nothing quite as sure as change. In business, yes even the utility business, there is no standing still. Either we're progressive or backward, active or stagnant, improving or deteriorating. These plans, designed though they are to meet customer needs and wishes today, may be obsolete tomorrow.

It is therefore imperative that we keep in constant touch with customer reaction—both favorable and adverse. From those customers who bring their troubles to us we shall analyze causes and prepare summaries for review so that appropriate and prompt action may be taken to alter and improve our plans. So that we may know how those who do not come to us feel about our service we shall make periodic at-the-home surveys of a percentage of our customers, the results of which will be compared with summaries from customers who have brought their problems to us.

People will cheerfully pay a dollar for something they like but will grudgingly proffer a dime for the same something if it does not gratify their wishes. Let us not forget, *what the customer wills he gets,* either by reducing to the barest minimum the use of that which he does not like or by taking his business where he receives satisfaction. Because of the attitude which many people take toward us, the utility industry is much like the very sick Irishman who was asked by the priest if he had made peace with the Lord and denounced the devil. "I have made peace with the Lord, Father," replied the Irishman, "But I am in no position to antagonize anyone."

Long ago we left the era wherein our products were of a non-competitive monopolistic character. Every moment of every day we shall be competing for a part of the customer's dollar. The future progress of our business—if not its very existence—depends upon our ability to recognize, before our competitors, the will of the people we serve and so alter, broaden and extend our services that those desires may be fully satisfied.

Did You Get Your Gas Analysis Book Yet?

- **The Technical Section of the American Gas Association has announced that copies of the authoritative book entitled "Gas Analysis and Testing of Gaseous Materials," by V. J. Altieri, Eastern Gas and Fuel Associates, Boston, is still available.**
- **It is a comprehensive book of standards for sampling, analyzing and testing gases and gas mixtures containing varying amounts of liquids and solid dispersoids.**
- **A summary of technical literature is included, together with hitherto unpublished details obtained from contemporary workers in many scientific and technologic fields.**
- **"Gas Analysis and Testing Gaseous Materials" contains 560 pages of practical information for the chemists, engineers and technicians of the industry, and is on sale at the headquarters of the American Gas Association, 420 Lexington Avenue, New York 17, N. Y. It is priced at $5.00 to members and $7.50 a copy to non-members.**

Laboratories

GEORGE E WHITWELL, Chairman

R. M. CONNER, Director

Utilities Credit Men Visit Laboratories

A GROUP of utilities credit men were recent guests of the A. G. A. Laboratories, taking advantage of their presence in Cleveland attending the convention of the National Retail Credit Association. The group was composed of representatives of both gas and electric utilities who were not acquainted with the facilities and services rendered by the Laboratories.

After an introductory talk by the Laboratories' Assistant Director, guides conducted the visitors through the premises. P. E. Ewers, superintendent, customer relations, Michigan Consolidated Gas Company, and chairman of the group, reported the guests expressed keen interest in inspecting the testing of gas appliances and viewing at firsthand the various research studies under way.

Local co-chairmen who made arrangements for the trip were C. W. Tobey of The East Ohio Gas Company and H. D. Ballard of the Cleveland Electric Illuminating Company.

Clark Rejoins Staff

NAVY Lieutenant Howard C. Clark, chief engineer aboard the destroyer *USS Gherardi* during the war, has returned to the A. G. A. Laboratories and resumed his former duties in the Inspection Department.

Lt. Clark is a veteran of four years of intensive action, having participated in six invasions in three major war theaters. He also made forty convoy trips across the Atlantic.

He saw action in the Mediterranean, Atlantic and South Pacific, taking part in the invasions of Normandy, Southern France, Sicily, North Africa, Okinawa and Iwo Jima. In the Okinawa campaign his ship was the only one of twelve to escape being hit, three being sunk outright and the others damaged. His destroyer completely escaped damage or any casualties whatsoever throughout the entire war. Following the cessation of hostilities, he was in charge of commissioning destroyers in Texas.

Lt. Clark was graduated from Ohio Northern University as a mechanical engineer, joining the Laboratories in 1940. While in Texas he met and married Lt. Anne C. Arnold, a Navy nurse, whose home is in Macon, Georgia.

Broaden Approach to Design of Heating Equipment

SEEKING a broader scientific approach to the design of central gas heating equipment, one of the most outstanding and important research projects under way at the American Gas Association Testing Laboratories centers on the development of fundamental heat transfer data.

Sponsored by the Committee on Domestic Gas Research, the work is being carefully guided by the Technical Advisory Group for Central Gas Space Heating Research in order that additional aids may be given designers in predicting temperature distribution in combustion chambers and the elimination of hot spots.

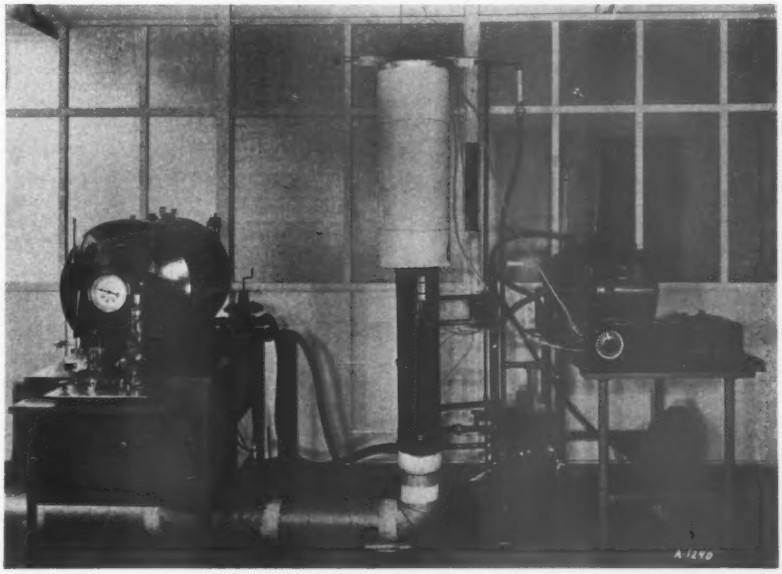
Little data of a practical nature on fundamental laws governing heat transfer through heating element surfaces exposed to direct radiation from burner flames are available at present. The current research project is directed towards supplying such information as well as establishing the proportion of total heat transferred by radiation, combustion and convection, this representing one of the most complex problems involved in heat transmission studies. Efforts are being made to determine the combined heat transfer coefficients vertically along the length of an experimental heating element specially constructed for the purpose.

In order to minimize errors in the determination of heat transfer coefficients of gases inside the exchanger, known quantities of air, which possesses a high heat transfer coefficient, are forced past the outside of the heating element but within the insulating jacket. Air and gas are metered at a predetermined rate in known proportions before the mixture is burned, thereby providing control of primary air, secondary air, and gas input rate. Temperatures of inlet and exchanger air, heating element and jacket surfaces, and flue gases are recorded.

Upon completion of the investigation it is intended that data will be presented in such a manner as to make them applicable to gas-fired heat exchangers that may be air, water or oil backed. It is planned to compile a series of tables, charts and sample calculations which will facilitate work of design engineers in applying the data. Information will be augmented to the extent practicable by data from literature in order to incorporate such variables as flame temperature and mass, shape of combustion chamber and addition of baffles.

Welding Bulletin

A. M. BYERS Company, Pittsburgh, has announced that a service bulletin covering recommended practices for welding and flame cutting of wrought iron pipe and flat-rolled products now is available for distribution. Pioneers in the development of radiant gas heating and automatic snow melting systems, the company states that proper welding procedures are important in the fabrication of such systems, as well as for installation of other wrought iron piping services in the plumbing, heating, ventilating and refrigeration fields. The book contains a comprehensive welding chart that can be removed and tacked on a wall.



Domestic gas research on fundamentals of heat transfer. Temperature of flue gases, heating element and jacket surfaces, and inlet air are recorded

Associated Organization Activities

New Jersey Association Elects Officers

P. D. Gardner

P. D. GARDNER, Public Service Electric and Gas Co., Camden, N. J., has been elected president of the New Jersey Gas Association. New officers were elected at a meeting in Trenton, April 26, the first meeting of the Association since the start of the war. At the same time a new constitution was adopted, making the Association year end on September 30 of each year, coinciding with the A. G. A. fiscal year.

In addition to Mr. Gardner, the following officers were named: first vice-president, H. H. Melvin, The Cumberland County Gas Co.; second vice-president, Harry A. Sutton, Public Service Electric and Gas Co.; secretary-treasurer, Elmer A. Smith, Public Service Electric and Gas Company.

Directors elected for three years are: L. W. Becker, Elizabethtown Consolidated Gas Co., H. H. Ferris, Public Service Electric and Gas Co.; E. J. Menerey, Peoples Gas Co.; T. H. Powers, Salem Gas Light Co.; and Earl Smith, Atlantic City Gas Company. C. B. Webber, Public Service Electric and Gas Co., was made a director for two years, and T. R. Dobson, Jersey Central Power and Light Co., was named director for one year.

Florida-Georgia Group Chairmen

B. G. DUNCAN, president of the Gas Meters Association of Florida-Georgia, has announced appointment of the following committees and chairmen for the 1946-1947 term:

Accounting—J. K. Roberts, Florida Public Utilities Co., chairman.

Legislative—I. J. Wynn, Gainesville Gas Co., chairman.

Membership—A. J. Lawlor, Southern Gas & Electric Corp., chairman.

Safety—R. P. Jones, Central Florida Gas Electric Corp., chairman.

Sales—C. W. Sweet, Peoples Water & Gas Co., chairman.

Technical—John O. Sholar, South Atlantic Gas Co., chairman.

Representatives on A. G. A. sectional managing committees have been selected as follows: Residential—C. W. Sweet; Technical—John O. Sholar; Accounting—J. K. Roberts; and Commercial & Industrial Gas—A. L. Jones.

Canadian Convention Sets New High Note

ONE of the most fruitful and satisfying conventions in its thirty-nine year history was held by the Canadian Gas Association the week of June 17 at Murray Bay, Province of Quebec. More than 300 delegates from Canada and many parts of the United States found the business program and boat trip entertainment features highly to their liking.

Lieutenant Colonel Thomas Weir, general manager, Union Gas Co. of Canada Ltd., Chatham, Ont., was elected president to succeed J. D. von Maur, engineer of distribution, Consumers Gas Co. of Toronto, Ontario. E. H. Rohrer, B. C. Electric Railway Co., Ltd., Vancouver, B. C., was named first vice-president and F. A. Brownie, Canadian Western Natural Gas, Light, Heat and Power Co., Ltd., Calgary, Alberta, was selected for second vice-president. George W. Allen, whose management of the convention received high praise, was re-elected executive secretary and treasurer.

Of special interest at the convention, was the formation of a Manufacturers' Section and the election of A. J. Strain, general manager, Ruud Manufacturing Co., Toronto, as chairman. There are no other sections of the Canadian Gas Association.

The S. S. Tadoussac took most of the visitors on the 270-mile trip down the St. Lawrence River from Montreal to Murray Bay on June 17, where the delegates stayed at the famous Manoir Richelieu Hotel. After a stay of more than three days, the delegates divided, with some going down to the Saguenay River and the remainder returning to Montreal.

Well-attended sessions featured addresses and papers covering such topics as economics of gas house heating, factors in gas industry progress, dealer cooperation, appliance standardization, LP-gas utilization, organic sulfur problems, and pipe line protection. The major part of an outstanding report on the Canadian gas industry by E. J. Tucker, Consumers Gas Co. of Toronto, is reproduced as the leading article in this issue of the MONTHLY. Hall M. Henry, Negea Service Corp., Cambridge, Mass., presented a valuable paper on the economics of the gas industry, with particular attention to gas house heating, in which he referred to the studies of the A. G. A. Postwar Planning Committee of which he was a group chairman. Another report of unusual significance was that on dealer cooperation and appliance standardization by S. B. Severson, president, Dominion Natural Gas Co., Ltd., Buffalo.

Other speakers at the general sessions included H. Vinton Potter, American Gas Association; P. W. Geldard, Consumers Gas Co. of Toronto; J. A. Morrison, Consumers Gas Co. of Toronto; V. J. Jenkinson, Minneapolis-Honeywell Regulator Co., Ltd., Toronto; B. C. Blizzard, Imperial Oil Ltd., Toronto; H. D. Lehman, The Philadelphia Gas Works Co.; N. L. McNiven and I. J. W. McHaffie, joint authors from Ontario Research Foundation, Toronto; and P. D. Mellon, Canadian Western Natural Gas, Light, Heat & Power Co., Ltd., Calgary.

E. Carl Sorby, vice-president, Geo. D. Roper Corp., was the guest speaker at the annual banquet. He gave an entertaining and illuminating talk on the gas industry's future.

Southern Gas Association Maps Program

THE Advisory Council, made up of representatives from each of the Southern Gas Association member companies, and the Executive Committee, consisting of the officers, directors, and past presidents, met in Dallas on June 10, to determine the Association's operating objectives.

Objectives have been set up as follows:

1. To supply member companies with statistics on operating results.

2. To plan for conferences of employees to be held on a sectional basis.

Committee chairmen were instructed to carry on their activities in accordance with these objectives. Chairmen for the current year are:

Accounting—F. F. McMullen, United Gas Corporation, Houston.

Home Service—Julia Hunter, Lone Star Gas Company, Dallas.

Industrial and Commercial—D. D. Beach, Atlanta Gas Light Co., Atlanta.

Operating—F. L. Carmichall, Lone Star Gas Co., Ft. Worth.

Safety—Robert M. Hutchison, Houston Natural Gas Corp., Houston.

Sales—C. H. Horne, Alabama Gas Co., Birmingham.

Program Committee—1947 Convention—M. H. North, Oklahoma Natural Gas Co., Tulsa.

A proposed short course in gas technology

Officers and committee chairmen plan the Southern Gas Association committee program at a meeting in Dallas on June 10. Seated, left to right: W. H. Ligon, vice-president; Dean A. Strickland, president; Julia Hunter, Home Service; W. L. Woodward, vice-president. Standing: F. L. Carmichall, Operating; C. L. Horn, Sales; M. H. North, Convention; R. M. Hutchison, Accident Prevention; F. F. McMullen, Accounting. Don D. Beach, Industrial and Commercial committee chairman was unable to be present

to be offered by the Texas College of Arts and Industries at Kingsville, Texas, was proposed by Dr. Frank H. Dotterweich, chairman of the Engineering Department of the College, who invited the Association to sponsor it. The Executive Committee approved the suggested course and President Dean A. Strickland will appoint a special committee to work with Dr. Dotterweich on it.

During the one-day session, the budget of the Association for the fiscal year ending March 31, 1947, was approved with expenditures for operation set at $19,750.00 and expenditures for furniture, fixtures, and other needed equipment at $4,150.00. L. L. Dyer, treasurer, reported on cash receipts and disbursements for the period March 1 through May 31, 1946, and R. R. Suttle, managing director, reported the membership of the Association as of June 1, to be 763 individual members, 31 utility company members and 39 manufacturer-distributer members. President Strickland appointed W. L. Woodward, chairman of the membership committee.

A special committee consisting of Seward Abbott as chairman, assisted by J. H. Satterwhite and F. J. Evans, was directed to report on how the Manufacturers' Section may best serve the Association and the manufacturer-distributor members. President Strickland also announced the appointment of M. H. North as chairman of the General Convention Committee, to be assisted by C. F. Johansen, W. H. Ligon, W. L. Woodward, and Streube L. Drumm.

The Executive Committee accepted the resignation of Joseph N. Greene of the Alabama Gas Company as a director and elected Carl H. Horne to serve out the unexpired term.

Those attending the meeting unanimously approved the future establishment of a transmission committee. The Membership Committee was directed to study the problem of transmission company membership and participation in the Association activities.

Prior to the General Meeting, the officers and committee chairmen conferred on the selection of committee members.

Manufacturers Hold Outstanding Meeting

D. P. O'Keefe

D. P. O'KEEFE, president, O'Keefe & Merritt Co., Los Angeles gas range manufacturers, was elected president of the Gas Appliance Manufacturers Association at the annual meeting of the Association held in Chicago, June 11-12. Lyle C. Harvey, president, Bryant Heater Co., is the retiring president.

Other new officers are: first vice-president: John Robertshaw, president, Robertshaw Thermostat Co., Youngwood, Pa.; second vice-president: Frank Hoenigmann, executive vice-president, Florence Stove Co., Chicago, Ill.; treasurer: John Van Norden, secretary, American Meter Co., New York, N. Y.

The meeting, which was one of the largest ever held by the Association, brought together chief executives of manufacturers who produce more than 90% of all the gas appliances and equipment manufactured. Membership in the Association has increased 40% in the past two years.

Problems discussed by the attending executives were production bottlenecks in materials and strikes which have prevented the industry from reaching the 50% increase in production over 1941 which expanded facilities make possible. Plans to assist government agencies, dealers and builders in providing equipment for housing and home and industrial modernization programs were discussed at group meetings of manufacturers of various types of equipment.

Among the speakers were Everett J. Boothby and H. Carl Wolf, president and managing director respectively of the American Gas Association. Mr. Boothby briefly reviewed the gas industry's research program and commented upon the unity which prevails among all branches of the industry. Speaking on "Cooperating for Profit," Mr. Wolf emphasized the common interests of manufacturers and utilities and called for an adequate nationwide dealer organization.

New gas clothes drier and summer & winter gas air conditioning divisions have been created to serve the many manufacturers who have entered this field.

Newly-elected chairmen and vice-chairmen of the product divisions were announced as follows:

Domestic Gas Range Division—Chairman, Lloyd C. Ginn, American Stove Co.; Vice-Chairman, R. S. Agee, Roberts & Mander Corp.

Hotel, Restaurant & Commercial Gas Equipment Division—Chairman, Walter Rudolph, Savory Equipment Co.; Vice-Chairman, Stanley E. Little, American Stove Co.

Gas Water Heater Division—Chairman, Harold Handley, Handley Brown Heater Co.; Vice-Chairman, W. G. Cartter, Day & Night Manufacturing Co.

Direct Heating Equipment Division—Chairman, George McFadden, Ohio Foundry & Mfg. Co.; Vice-Chairman, W. L. Thompson, L. O. Schoedinger Mfg. Co.

House Heating & Air Conditioning Equipment Division—Chairman, C. A. Olsen, C. A. Olsen Manufacturing Co.; Vice-Chairman, J. P. Hutchinson, Bastian-Morley Co.

Industrial Gas Equipment Division—Chairman, E. J. Haedike, Mid-Continent Metal Products Co.; Vice-Chairman, Herman Gehnrich, Gehnrich & Gehnrich, Inc.

Thermostatic Control & Accessories Division—Chairman, T. T. Arden, Robertshaw Thermostat Co.; Vice-Chairman, C. S. Stuckenholt, W. J. Schoenberger Co.

Gas Valve Division—Chairman, R. L. O'Brien, Detroit Brass & Malleable Works; Vice-Chairman, Frank X. Henke, Harper-Wyman Co.

Gas Furnace Group—Chairman, I. E. Seith, The Forest City Foundries Co.; Vice-Chairman, D. J. Luty, Gar Wood Industries.

Gas Boiler Group—Chairman, J. R. Scott, L. J. Mueller Furnace Co.; Vice-Chairman, L. H. Hobson, General Electric Co.

Gas Conversion Burner Group—Chairman, G. A. White, Handley Brown Heater Co.; Vice-Chairman, E. A. Weaver, Surface Combustion Corp.

"CP" Manufacturers Group—Chairman, E. Carl Sorby, Geo. D. Roper Corp.; Vice-Chairman, A. B. Ritzenthaler, Tappan Stove Co.

Personal and Otherwise

Brown Heads Natural Gas Pipeline Co.

FLOYD C. BROWN, vice-president and general manager of Natural Gas Pipeline Company of America since its organization has been elected president, succeeding W. Alton Jones, who will serve as chairman of the board. Mr. Brown, according to the company's announcement July 5, will continue his duties as general manager. He has also been elected president of the Texoma Natural Gas Company and the Quadrangle Gas Company.

A graduate of Leland Stanford University, Mr. Brown joined the Empire Companies organization in 1917 and advanced rapidly through posts of engineering responsibility to become manager of the Empire Pipeline Company and chief engineer of Empire Companies in 1921. In 1923 he became assistant general manager of the Empire Companies, and in 1926 was elected vice-president. When the Continental Construction Company was formed in 1930 to build and operate the 24-inch Texas-Chicago gas pipeline, a $60,000,000 project, he was chosen to supervise its construction and direct its operations. Additional lines were built later. In 1931 the name, Natural Gas Pipeline Company of America, was adopted.

The company transports natural gas from southern Oklahoma, principally for delivery in the Chicago area, but with some distribution at other points along the line. Texoma Natural Gas Company is its chief supplier.

Alling Gets Rochester Industrial Post

SYDNEY ALLING, has been named manager of the Industrial Department of the Rochester Gas and Electric Corp., Rochester, N. Y., to succeed the late Ivar Lundgaard. Mr. Alling was graduated from the University of Rochester in 1909 after which he attended Massachusetts Institute of Technology for two years, receiving his Electrical Engineering degree in 1911. He entered the employ of the R. G. & E. in 1911 and served with the engineering, construction, distribution and industrial departments. Since 1931 he has been on the staff of the Industrial Department.

S. L. Drumm Returns From Navy Tour

STREUBY L. DRUMM has packed away his gold braid (a captain's four layers of it) and has returned to the New Orleans Public Service Inc. as general sales manager after nearly four years in the Navy.

A graduate of the U. S. Naval Academy, Captain Drumm was active in Naval Research affairs in Louisiana before the war and soon after the Jap attack, was called to Washington as officer-in-charge of the ship's service section of the Bureau of Naval Personnel, was later director of Special Services and awarded a commendation citation for his outstanding work.

L. P. G. A. Elects C. O. Russell

NEW officers elected by the Liquefied Petroleum Gas Association at its convention May 27-29 in Colorado Springs were:

President—Charles O. Russell, president of Thermogas Co., Des Moines, Ia.; executive vice-president—Howard D. White, Chicago; first vice-president—L. V. Rothrock, Twin Falls, Idaho; second vice-president—Wendell B. Wight, Albany, Ga. Other vice-presidents: Tallant H. Ransome, Emeryville, Calif.; Foster V. Maybee, Denver, and Walter A. Maumer, New York.

Arthur C. Kreutzer was named secretary and assistant treasurer, and Budd D. Geroy, treasurer, both from Chicago. Franklin R. Fetherstone, New York, an engineer who has been with the Association for a number of years, was advanced from secretary to vice-president of the technical division.

C. J. Allen Elected President of P. U. A. A.

Charles J. Allen

CHARLES J. ALLEN of Waterbury, Conn., vice-president of The Connecticut Light and Power Company, was elected president of the Public Utilities Advertising Association at the national convention of the organization held June 10 and 11 in Atlantic City, N. J.

Mr. Allen succeeds E. Norwood Pope of Raleigh, N. C., as president of the association, which is composed of advertising and public relations executives of electric, gas and transportation companies in the United States and Canada.

Other new officers elected include: Ted B. Ferguson, vice-president, Texas Power & Light Co., Dallas, Tex., first vice-president; Harold S. Metcalf, advertising manager, West Penn Power Co., Pittsburgh, second vice-president; Dale Remington, advertising manager, Wisconsin Public Service Co., Green Bay, Wis., third vice-president, Roy Knox, advertising manager, Birmingham (Ala.) Electric Co., secretary, and Mead Schenck, advertising manager, Inter-State Power Co., Dubuque, Iowa, treasurer.

Named to the board of directors were: Fred E. Eriksen, Wisconsin Electric Power Co., Milwaukee; William B. Hewson, Brooklyn Union Gas Co., Brooklyn; J. K. Flanagan, Florida Power Co., St. Petersburg, Fla., and Arthur P. Kelly, Rochester Gas & Electric Corp., Rochester, N. Y.

Forty national awards and seventy-eight honorable mentions in the 1946 "better copy contest" of the Association were announced at the final session of the convention by the contest chairman, Ted B. Ferguson. A total of 945 entries were submitted in the competition, which is the country's oldest national advertising contest.

Advanced to Auditor

Charles E. Reitzel

CHARLES E. REITZEL has been appointed auditor of receipts of the Electric, Gas, Steam, and Merchandise Receipts Division of the Accounting Department, Philadelphia Company and Subsidiary Companies, Pittsburgh, C. T. Harmon, controller for the companies, has announced.

Born and educated in Pittsburgh, Mr. Reitzel entered the employ of the companies in June, 1912, as a billing clerk, and has since served in various clerical and accounting capacities, most recently being assistant auditor of receipts.

Mr. Reitzel is a veteran of World War I and a member of Beaver Falls Post, American Legion.

Young a Trustee

PERCY S. YOUNG, chairman of the Executive Committee of Public Service Electric and Gas Co., Newark, N. J., was elected to the Board of Trustees of Rutgers University at the annual June meeting of that group. Associated with Public Service Corporation of New Jersey since 1903, Mr. Young is a member of the Executive Board and a past president of the American Gas Association.

Bartlett Returns

R. F. (TED) BARTLETT, JR., has re-joined the staff of the Dallas office of The Cooper-Bessemer Corporation as sales engineer, following five years of service in the Army, A. A. Burrell, branch manager, has announced.

Nashville to Expand Home Service

Carolyn Davis

CAROLYN DAVIS has been appointed home service director of the Nashville Gas and Heating Co., Nashville, Tenn., and that company's home service activities will be greatly expanded, Terry Hart, general sales manager, has announced. In addition to customer follow-up of appliance sales, a demonstration kitchen and a work kitchen will be installed in an auditorium of the company's new building. Change-over to natural gas is expected in mid-summer.

A graduate in Home Economics at the University of Tennessee, Miss Davis was employed as a laboratory technician in the research division of Standard Oil Co. of New Jersey at Bayway. Previously she was a teacher of home economics and biology at Bellevue High School near Nashville.

She is a member of the American Home Economics Association and Home Economics Women in Business.

Stall Appointed

Frank H. Stall

FRANK H. STALL has been named sales manager of Floyd and Company, Inc., Cincinnati, Ohio, distributors for Servel, Inc. Mr. Stall, 34, is a native of Cincinnati. He attended the University of Cincinnati and was associated nine years with the Cincinnati Gas and Electric Company in various sales capacities. Prior to joining the Floyd organization, Mr. Stall was with the Firestone Tire and Rubber Company.

Joins Agency

C. W. EIGENBROT, formerly advertising manager of Selas Corporation of America, Philadelphia, has joined Harris D. McKinney Advertising, Philadelphia, as an account executive.

Win McCarter Awards

WILLIAM G. SMITH and Henry M. Graham, fitters in the Customer's Service Department of The Philadelphia Gas Works Company, were recently awarded McCarter medals and certificates for their outstanding acts of life saving by application of the Schafer prone pressure method of resuscitation. The presentations were made June 24 at a staff meeting of President Hudson W. Reed.

These awards bring the total McCarter Medals presented to The Philadelphia Gas Works Co. employees to sixty-nine, the first one having been presented in 1925.

On Coleman Board

DEAN OLDS, chief design engineer of the company's major appliance division, has been elected a member of the board of directors of the Coleman Co., Inc., at a meeting in Wichita, Kansas, May 21.

Mr. Olds, who joined the company in 1929, is a graduate in mechanical engineering of Cornell University and a member of several technical and professional societies.

The following board members were re-elected: W. C. Coleman, president and founder of the company; C. B. Kuhn, secretary and controller; Hiram W. Strong, consulting engineer; and A. B. Eisenhower, vice-president of the Commerce Trust Co., Kansas City, Missouri.

Howard Gets New Post

E. T. Howard, for the past 11 years sales manager for General Controls Co., Glendale, Calif., has been named general sales manager of Fraser and Johnston Co., San Francisco, producer of gas furnaces. He is a director of the Pacific Coast Gas Association and Gas Appliance Manufacturers Association.

Alec Easton, formerly assistant sales manager for Ray Oil Burner Co. and more recently a major in the U. S. Army, will serve as assistant sales manager.

Management Group Elects Carpenter

I. M. Carpenter

RELECTION of I. M. Carpenter, manager, Insurance Department, Ebasco Services, Inc., New York City, as vice-president of the American Management Association was announced June 16 by Alvin E. Dodd, A. M. A. President. He will serve as vice-president in charge of the Insurance Division.

Mr. Carpenter is also a member of the Insurance Committee and chairman, Rating and Forms Subcommittee, Edison Electric Institute; Chairman, Insurance Committee of the American Gas Association; a member of the National Fire Protection Association, the Risk Research Institute, the International Association of Electrical Inspectors and the American Society of Safety Engineers.

Ernst to Caloric

L. H. ERNST has been appointed southeastern district sales manager of Caloric Gas Stove Works, with headquarters in Winston-Salem, N. C., it is announced by Julius Klein, general sales director. Mr. Ernst was formerly with American Gas Machine Co. and Duke Power Company.

Fogg, A.G.A. Past President, Retires

Oscar H. Fogg

OSCAR H. FOGG, chairman of the executive committee of Consolidated Edison Co. of New York, Inc., since 1942, retired last month in accordance with retirement rules of the company. He will continue as a member of the board of trustees. The post which he has held has been abolished by the company.

Mr. Fogg, associated with Consolidated Edison since 1934, began his long and distinguished career in the public utility industry with United Gas Improvement Co. in Philadelphia, the city of his birth. In 1899 he became a cadet engineer of that company at its plant in Yonkers. Three years later he was named superintendent of Newton & Flushing Gas Co., which subsequently became part of Consolidated Edison. In 1904 Mr. Fogg joined Consolidated Gas, working at various research and engineering jobs.

During World War I he entered the Army and was engaged in the designing of plants for repair and maintenance of ordnance material in France, and also in recruiting and in organizing and training enlisted and commissioned personnel. He was placed in command of the Construction and Maintenance Divisions of the Ordnance Department, A. E. F., with the rank of lieutenant-colonel. The French Government gave him the Ordre de l'Etoile Noire, and the United States gave him the Distinguished Service Medal.

In 1919, upon his discharge from the Army, Mr. Fogg became secretary-manager of the American Gas Association, returning to Consolidated Gas Co. in 1924 as vice-president. In 1937, after mergers of several of the gas and electric companies in the system and the change of name to Consolidated Edison Co., he was elected vice-chairman of the board. He retained that title until he became chairman of the executive committee in 1942.

Mr. Fogg was president of the American Gas Association for two years, beginning in 1927. He has recently served as a member of the Mayor's New York City Post-War Industrial Committee.

INDUSTRIAL MAINTENANCE

(Continued from page 344)

what was done during the war, a brief description of a few specific installations will be given.

The Brooklyn Navy Yard was one of the most vital contributors to the war effort. All its operations were tremendously expanded during the war. Here is how we helped: Large new ovens and furnaces would be ordered. They would arrive in pieces and just be dumped on the floor. As hard-pressed manufacturers' representatives could not take time to erect, install and start them, our men assisted in doing this work. Weeks of valuable time were saved through their familiarity with such equipment, in showing Navy Yard personnel how to assemble and connect it, and in performing the adjustments to controls, mixers, burners, etc., necessary to start and place it in operation. This was done for foundry crucible melting furnaces, for large steel pipe annealing furnaces, for forges and for large core baking ovens.

Our work at the Navy Yard received recognition to the extent that several of the men were mentioned by name in the weekly publication, "Navy Yard Shipworker." In this type of work personalized service is actually developed without any direct effort on our part to attain exactly that result. Many customers will not buy a piece of equipment, or allow a manufacturer to start one without advice from Henry, or Joe, or Gus, as the case may be. These fellows have built up real trust and confidence in the customers whom they serve.

Another type of service of particular benefit to customers engaged in war production consisted of adapting old equipment to new jobs, of making something do work for which it was never designed. At the Metropolitan Engineering Co., they made incendiary bombs, bazooka shells and land mines. They had seven large cleaning machines on hand from their former peacetime production of switchboard panels and other equipment. These machines were used to clean the grease and dirt off parts before applying a protective coating. They consisted basically of large solution tanks heated by immersion burners, through which this work was passed on conveyors. However, the capacity in their existing machines was insufficient. Since new ones would take months to deliver, we went to work, and by making considerable changes in the burners, changing the system to blast, we succeeded in doubling the capacity of each machine.

Another interesting example of service is not connected with war, but shows how we sometimes rely on other departments for their cooperation and help. In September, 1944, the great storm blew down the power lines to the crematory. The retorts here are all fired by Maxon Premix burners, little motor-driven blowers where air and gas are premixed and delivered to burner nozzles. Power is essential. The Edison Co. said it would take days to repair the line. We asked for and obtained a compressor from the Street Section. Using air from this, and our never failing gas supply, the correct air-gas mixture was supplied to the burners and operation resumed.

When the war ended, war contracts were cancelled overnight. The pressure was on to reconvert. The urgency was not so great, but nevertheless we were vitally interested in conserving the wartime load, in trying to keep it at as near wartime levels as possible. The work did not involve so much actual changing of equipment, but rather starting new pieces of apparatus, devising new burner hook-ups, and in general helping new concerns who sprang up almost overnight to fill the great demand for consumer goods. One example will suffice, and will also show why our industrial load has not suffered the violent drop that some of us expected. The Frank J. Quigan Company during the war made 40 mm. shell clips. They produced vast quantities of these, but their total gas consumption was only about 150M to 200M cubic feet per month. Now they are on full-time production of ladies' pocketbook frames and automobile radiators. They have put in a great deal of new equipment, on all of which our maintenance group has performed valuable service. Their consumption now is over 500M cubic feet per month and they are on our No. 3 rate contract.

MOISTURE PROBLEM IN HOUSING

(Continued from page 322)

blamed for excessive moisture conditions should they occur from any cause. It is because gas combustion forms large quantities of water vapor that many in the industry feel it is in the best interests of the gas industry to take the leadership position in promoting the use of designs which will prevent condensing conditions from any ordinary living habit.

As far as I know now, the most practical method of control is to thoroughly dilute interior air with relatively dry outside air in such a manner as to avoid drafts or any discomfort. In such an operation the proper and dependable functioning of chimney flues is most essential.

Some strange things happen in these new tight houses as regards the performance of flues. It is possible for the kitchen exhauster to cause the flue for the furnace to act as an air intake for the air that is being forced out of the kitchen. And it is possible that the natural draft in the furnace chimney will continually pull its supply of air down the flue provided for the water heater.

The cause of this reversal of flue flow is obvious. Air will flow to a fan exhaust or a chimney from the freest opening to the outside. If the house is tight the most likely source of outside air is a chimney opening. I have seen such conditions in houses that were not as small nor as tight as the houses that are soon to be built in large volume. We have measured the negative pressures which continually exist in such houses when the windows and doors are closed, as they always are in severe cold weather. We have demonstrated how such a condition becomes normal and the flue flow reverses itself and properly discharges products of combustion when the negative pressure is relieved by opening a door.

Purdue Research

Last winter, C. E. Blome of the Purdue Research Foundation made a field investigation of venting conditions in many of the larger cities from coast to coast as a part of our research work. The extent of the unstable venting conditions encountered was amazing even to us who have become accustomed to encountering unsatisfactory installation conditions. And please keep in mind that Mr. Blome's field investigations for us have not touched on the modern small tight houses in which the moisture conditions promise to be more critical unless definite steps are taken to guard against critical condensing air conditions.

The Domestic Gas Research Program of the A. G. A. has been under way for over seven years on projects relating to various parts of gas appliances. That kind of research is entirely confined to technicians in laboratories, and to appliances. Last year two research projects were started which relate entirely to the application of *gas service*. They are the Home Humidity Control Project (DGR-8-C) and Venting Arrangements Where Standard Chimney Connections are Not Available (DGR-1-DH). These two projects are under way at the Purdue Research Foundation.

It is through the work of these two projects that we hope to devise arrangements which will eliminate the damaging conditions I have been talking about. I think you are justified in assuming that arrangements will be devised that will insure that gas service of all types can be eminently satisfactory in these small homes.

The big problem will be to sell builders and the public on the benefits that

will accrue to them by providing the facilities whereby gas can be served properly in these small modern dwellings. It seems certain that this process will involve extensive educational work on the part of the gas industry. It will not appear reasonable to many to provide for the admission of sizable quantities of cold air after they have been educated for years that modern houses should be tightened up as much as possible to keep out cold air.

You should anticipate that other interests will promote their products and services without regard for our interests. You should anticipate that when competitive situations again are commonplace, there will be plenty of questioning of our motives when we insist that the controlled admission of outside air in cold weather is essential for proper air conditions in these small tight houses.

The fast increasing trend of gas house heating has been a large factor in the increasing demand for the products of the weather proofing industry. A glance at the classified ad section of any Sunday issue of a metropolitan paper is convincing evidence that weather proofing is a business whose main appeal is savings in fuel costs to pay for the costs of installations. It is not likely that there will be any lessening of the efforts of the weather proofing industry to convince the public that they should save fuel by keeping out cold air.

I mention these factors to show that the situation will be complex and that we must be well prepared to sell construction details which we believe are in the public interest. I think it is wise to develop complete knowledge of what is probable in the future and to form plans and organizations to suit the probable conditions.

There is no reason why the industry should feel that they are handicapped by these conditions. Gas service can be extremely useful in eliminating the excess moisture that forms in these houses from normal living habits. Properly ventilated houses in which gas is the only fuel used will be much more livable than tightly sealed houses using other fuels. It is up to us to organize our affairs in such a way as to give the industry a new and effective sales tool. That tool is proper and needed ventilation.

LP GAS PLANT PRACTICE

(Continued from page 320)

appliance burners which are used continuously as a guide to appliances performance. These include an oven burner, various range burners, various automatic water heater burners, a gas refrigerator burner, a standard Rutz lighter and three different house heating pilot lights. These burners are lighted periodically during the day to see that they operate satisfactorily in actual performance. At the right of Figure V is the precision control burner known as the Rochester Test Burner. This was developed by Louis Schnidman and Jesse Yeaw of the Rochester Gas & Electric Corporation. The development of this burner and its use is covered in their paper entitled, "Determination of the Combustion Characteristics of Fuel Gases," published in 1940.

The theory behind this burner is that for a one-inch cone height, the base gas will have a certain reading on a graduated scale located near the base of the burner. This scale reading is called the "burner number." Theoretically, to interchange perfectly with a base gas, another gas should have the same burner number for a one-inch cone height, and the variation of the burner number of the replacing gas from the burner number of the base gas is a measure of the interchangeability performance of the replacing gas. Mr. Schnidman specifies a maximum allowable variation of 17 burner numbers, plus or minus from the base gas burner number. In our situation the base gas burner number is 300. Therefore, theoretically, the maximum allowable burner number would be 283 on the low side or 317 on the high side to give satisfactory performance in customers' appliances. Similar burner numbers are read when a yellow tip appears on the flame, and when the flame blows off the burner. The range of burner numbers for these flame conditions is considered along with the one-inch cone burner number in determining satisfactory appliance performance.

In actual operation the burner is connected to the gas sampling line from the inlet to the gas holder, so that a continuous sample is obtained of the final mixed gas, and burner numbers are read at least once an hour to see that performance is being maintained, even though the specific gravity and B.t.u.'s are exactly according to the desired curve of Figure IV.

For the best interchange performance the interchanging gas should be according to the 0.450 curve of Figure IV. However, maximum allowable variations in performance permit us to run on a somewhat leaner curve.

In actual operation with our base gas alone, we have found that unsatisfactory appliance performance begins when the specific gravity approaches 0.520. Between 0.450 and 0.520 there is a specific gravity which is satisfactory for emergency service, or at about 0.480.

When it became necessary to use LP gas-air mixtures last winter, our problem was to determine on which one of the specific gravity curves (Figure IV) we should operate. There is quite a difference between the final B.t.u. required by the different curves, and each extra B.t.u. means added cost. For instance, referring to Figure IV, assuming the specific gravity of the gas entering the holder is 0.600, the B.t.u. according to the 0.450 curve should be 573 to give the best performance to the customers. However, if the interchange is according to the 0.480 curve, the B.t.u. required is only 561, or 12 B.t.u.'s per cubic foot less than according to the 0.450 curve. If interchange is according to the 0.520 curve, the B.t.u. required is only 543, or 30 B.t.u. less than according to the 0.450 curve.

Accordingly, it was decided to operate on the "medium performance" curve of 0.480. When performance on this curve proved to be satisfactory we went to the 0.490 curve. When performance remained good, we boosted to the 0.500 curve. At this point the flames on the appliances began to be somewhat hard, and it was decided to drop back to the 0.48 curve; and this is the one on which we usually operate.

Table I shows sample operating figures from a few days' operation. Part "A" is of days during which the purchased coke oven gas was normal, and 2400 MCF of LP gas-air were being made per day. Columns 7 and 8 show the days' average B.t.u. and specific gravity of the gas sent out, and Column 9 is the curve on which we operated on that particular day. This is found by plotting on Figure IV the values in Col-

umns 7 and 8, and Column 9 represents the curve nearest their intersecting point. These days were near the beginning of our operating experience, and although we tried to operate on the 0.48 curve, actual operation averaged on the 0.450 curve.

Part "B" shows the operation for the week of May 8 to 12. During this time, the coal strike was on and the operation of the coke ovens was curtailed to save coal; so the quantity of coke oven gas received by us was down to about one-third and less, of the normal quantity. To replace this deficiency, large quantities of reformed refinery oil gas had to be taken in from the plant at Chester.

Without LP gas enrichment, the specific gravity of the gas sent out would have been well over the 0.520 limit allowed; as for instance, the mixture for May 8 would have given a sendout specific gravity of nearly 0.580. If this gas had gone out into our mains, appliance performance would have been very poor. With the LP gas equipment, plant operation was according to the figures shown in Columns 7, 8 and 9, and customers received satisfactory service. It is also worthwhile noting that actual operation was supposed to be according to the 0.48 curve, and Column 9 shows that that is exactly what was averaged for the day. During all of the operation, the burner number averaged about 290. The lowest number was 285, and many were around 295. At no time was the burner number under the minimum 283.

A careful check was made with the Distribution Department to determine actual performance on the customers' premises and the over all operation was indeed very satisfactory. Additional service calls were practically negligible and all in all the customers received satisfactory performance during the emergency.

Table I also shows the use of the two methods of B.t.u. control, as described previously; that is, in February, B.t.u. control was obtained on the jet compressors, while in May the B.t.u.'s were controlled by cold enriching.

As I mentioned previously, the immediate concern in the Philadelphia Electric Company has to do with the coming winter when, it is estimated, the sendout specific gravity on maximum days will be as high as 0.740 and the B.t.u. as high as 618, and the production of LP gas-air mixtures will amount to between 8000 MCF and 12,000 MCF. During this summer, these anticipated mixtures will be tested in the laboratory to determine actual appliance performance, and what remedy, if any, is required.

All in all, our plant practice in using LP gas has proven very satisfactory in maintaining good appliance performance, and the curves based upon the Knoy formula have proven themselves excellent guides to satisfactory interchangeability characteristics of our replacing gas.

Our practice may not be suitable in some other situation. Other plants have developed different practices. However, I have spent some time describing ours because I believe it is rather unique, and may prove to be helpful to some other company which wants a practice that will produce LP gas-air mixtures with a minimum of equipment, yet permitting very flexible operation, both in quantity of gas produced and in the B.t.u. which that gas contains.

So far we have used only butane at our West Conshohocken Plant. The equipment is built for propane, however, and I expect that we will use quite a bit of propane gas as time goes on. Whatever the LP gas will be, I am sure it will be satisfactory and aid us in maintaining our usual satisfactory service to our customers.

SERVICES OFFERED

Expert **Store** and **Heating Salesman**—Services now available. Years of experience contacting wholesale and retail trade and utilities in all eastern and southern territories. Capable of serving as Sales Manager—Specialty Man—Conducting Promotion Campaigns—Directing Distributors and Agencies selling forces. **1522.**

Manufacturer's Representative—located New York metropolitan area, desires several non-competing industrial gas equipment items. Excellent nationwide contacts with the Can manufacturers, Baking and other industries. Broad experience gas combustion. Licensed Professional Engineer. Sales Commission Basis. **1523.**

Single woman (24), four years intensive **Distribution** training and experience. Duties: Office Supervision and Field Work consisting of vegetation and leak surveys and mapping of old and new construction. Proficient in use of combustible gas indicators and electronic pipe locators. Experienced in customer and employee relations. **1524.**

Man with twenty-three years experience with two large Eastern gas companies in Fitting Dept., Appliance **Testing** Laboratory, Manager **Industrial** Fuel Dept.. and Superintendent of **Distribution.** Combustion and Mechanical Engineer with nationwide manufacturing company over three years. **1525.**

Chemical Engineer, B.S. Illinois Tech 1944, one and a half years experience in research and development on high temperature furnaces, preparation of super-refractories and oxy-hydrocarbon flames. Desires responsible position in production or development. Available immediately. 23, single. **1526.**

Engineer—Nine years experience in Manufactured Gas Engineering, Production, Distribution and Service desires position with progressive utility. Former Lieutenant U.S.N.R. Licensed Professional Engineer. Member A. S. M. E., M. E. 34. **1527.**

Controller—Accountant—Auditor—More than 20 years experience in executive positions as General Auditor of five companies comprising Gas, Electric, Street Railway, Telephone, Bus Utilities. Handled all Treasury matters, Taxes and instituted sales promotion programs, public relations policies. Also have had experience as Division Manager in Natural Gas Operations. 50. **1528.**

POSITIONS OPEN

A progressive expanding gas company located in the Puget Sound country of the Northwest, has openings in the Engineering Department for men with the following qualifications. All must be **Graduate Engineers** under 45 years of age:

Distribution Engineer

With five years actual experience in Gas Distribution and Transmission Design. To assist Chief Engineer in development and expansion of transmission lines, feeders and distribution grid. Conduct Pressure Survey and work out Distribution Maintenance Schedules.

Distribution Main Draftsman

To keep up distribution main maps, extensions and retirements. Keep monthly and annual main records. Set up new detailed main plats using data from field books and work with Distribution Engineer.

Mechanical or Civil Engineer (recent graduate)

To start as Draftsman to work on both production and distribution engineering problems. Man of cadet caliber to learn engineering department functions. Work to include field contact.

Write giving full details as to age, education, experience and availability. **0460.**

Gas Range Engineer. Midwestern manufacturer requires the services of a man with good technical education and experience in product design, combustion, and A. G. A. testing procedures. Write fully, giving experience, salary expected and date available. Include photo if available. **0461.**

Laboratory Test Engineer. Midwestern manufacturer requires the services of a man with good technical education and experience in gas and electric range laboratory testing and development work. Write fully, giving experience, salary expected and date available. Include photo if available. **0462.**

Superintendent of service with thorough knowledge of servicing commercial gas burning equipment. National organization with locations in principal cities. Permanent. Give complete information including salary expected. **0463.**

Sales Manager for manufactured gas utility located in the South East, serving 22,000 customers. Should have education, training and experience to administer commercial, industrial and residential sales, merchandising, dealer coordination, home service and sales promotion. **0464.**

Experienced **Production** and **Distribution Superintendent** of proven ability, under forty years of age, as Assistant to Superintendent of Gas Operation. Properties total 80,000 meters. State age, education, experience, salary desired, and date available. **0465.**

ADVISORY COUNCIL

ERNEST R. ACKER.....Poughkeepsie, N. Y.
F. M. BANKS.....Los Angeles, Calif.
BURT R. BAY.....Omaha, Neb.
LYMAN L. DYER.....Dallas, Texas
RALPH L. FLETCHER.....Providence, R. I.
B. H. GARDNER.....Columbus, Ohio
GEORGE S. HAWLEY.....Bridgeport, Conn.
FRANK E. HOENIGMANN.....Chicago, Ill.
W. ALTON JONES.....New York, N. Y.
L. E. KNOWLTON.....Providence, R. I.
MALCOLM LEACH.....Taunton, Mass.
J. L. LLEWELLYN.....Brooklyn, N. Y.
H. N. MALLON.....Bradford, Pa.
L. A. MAYO.....Hartford, Conn.
C. E. PACKMAN.....Chicago, Ill.
BRUNO RAHN.....Milwaukee, Wis.
O. H. RITENOUR.....Washington, D. C.
W. F. ROCKWELL.....Pittsburgh, Pa.
LOUIS RUTHENBURG.....Evansville, Ind.
B. A. SEIPLE.....Asbury Park, N. J.
C. V. SORENSON.....Hammond, Ind.
MARCY L. SPERRY.....Washington, D. C.
J. H. WARDEN.....Tulsa, Okla.
R. E. WERTZ.....Amarillo, Texas
HARRY K. WRENCH.....Minneapolis, Minn.
CHARLES G. YOUNG.....Springfield, Mass.

ASSOCIATED ORGANIZATIONS

Gas Appliance Manufacturers Association
Pres.—D. P. O'Keefe, O'Keefe & Merritt Co., Los Angeles, Calif.
Man. Dir.—H. Leigh Whitelaw, 60 East 42nd St., New York, N. Y.

Canadian Gas Association
Pres.—Lt. Col. Thomas Weir, Union Gas Co. of Canada Ltd., Chatham, Ont.
Exec. Sec.-Tr.—George W. Allen, 7 Astley Ave., Toronto.

Gas Meters Association of Florida-Georgia
Pres.—B. G. Duncan, South Atlantic Gas Co., Orlando, Fla.
Sec.-Tr.—J. W. Owen, Central Florida Gas Corp., Winter Haven, Fla.

Illinois Public Utilities Association
Pres.—C. W. Organ, Central Illinois Light Co., Springfield, Ill.
Sec.-Tr.—T. A. Schlink, Central Illinois Light Co., Springfield, Ill.

Indiana Gas Association
Pres.—E. D. Anderson, Northern Indiana Public Service Co., Hammond, Ind.
Sec.-Tr.—Clarence W. Goris, Northern Indiana Public Service Co., 500 Broadway, Gary, Ind.

Michigan Gas Association
Pres.—Henry Fink, Michigan Consolidated Gas Co., Detroit, Mich.
Sec.-Tr.—A. G. Schroeder, Michigan Consolidated Gas Co., Grand Rapids, Mich.

Maryland Utilities Association
Pres.—O. H. Ritenour, Washington Gas Light Co., Washington, D. C.
Sec.—Raymond C. Brehaut, Washington Gas Light Co., Washington, D. C.

Mid-Southeastern Gas Association
Pres.—A. E. Jones, Tidewater Power Co., Wilmington, N. C.
Sec.-Tr.—Edward W. Ruggles, North Carolina State College, Raleigh, N. C.

Mid-West Gas Association
Pres.—E. C. Deane, Central Electric & Gas Co., Sioux Falls, S. D.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities
Pres.—J. F. Porter, Jr., Kansas City Power & Light Co., Kansas City, Mo.
Gen. Counsel—Wm. H. Allen, 101 W. High Street, Jefferson City, Mo.
Sec.—E. A. Beer, 101 W. High Street, Jefferson City, Mo.

Natural Gas and Petroleum Association of Canada
Pres.—S. A. Morse, Union Gas Co. of Canada, Ltd., Chatham, Ont.
Sec.—Jos. McKee, United Gas and Fuel Co. of Hamilton, Ltd., Hamilton, Ont.

New England Gas Association
Pres.—L. E. Knowlton, Providence Gas Co., Providence, R. I.
Exec.-Sec.—Clark Belden, 41 Mt. Vernon St., Boston, Mass.

New Jersey Gas Association
Pres.—Frank H. Darlington, Peoples Gas Co., Glassboro, N. J.
Sec.-Tr.—H. A. Sutton, Public Service Electric and Gas Co., Newark, N. J.

Oklahoma Utilities Association
Pres.—A. F. Potter, The Gas Service Company, Bartlesville, Okla.
Sec.—Kate A. Niblack, 625 Biltmore Hotel, Oklahoma City, Okla.

Pacific Coast Gas Association
Pres.—H. W. Edmund, Coast Counties Gas and Electric Co., Santa Cruz, Calif.
Man. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

Pennsylvania Gas Association
Pres.—Frank H. Trembly, Jr., The Philadelphia Gas Works Co., Philadelphia, Pa.
Sec.—William Naile, Lebanon Valley Gas Co., Lebanon, Pa.

Pennsylvania Natural Gas Men's Association
Pres.—B. D. Phillips, T. W. Phillips Gas & Oil Co., Butler, Pa.
Exec. Sec.—Mark Shields, 2619 Grant Bldg., Pittsburgh, Pa.

Southern Gas Association
Pres.—Dean A. Strickland, United Gas Corp., Houston, Texas.
Man. Dir.—Robert R. Suttle, 1011 Burt Building, Dallas 1, Texas.

Wisconsin Utilities Association
Pres.—B. E. Miller, Wisconsin Power and Light Co., Madison, Wis.
Exec.-Sec.—A. F. Herwig, 135 West Wells St., Milwaukee, Wis.

AMERICAN GAS ASSOCIATION

HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK 17, N. Y.

A. G. A. TESTING LABORATORIES • 1032 East 62nd Street, Cleveland 14, Ohio • 1425 Grande Vista Avenue, Los Angeles, Calif.
WASHINGTON OFFICE: Albee Bldg., Washington 5, D. C.

◀ OFFICERS ▶

President	EVERETT J. BOOTHBY	Washington, D. C.
First Vice-President	R. H. HARGROVE	Shreveport, La.
Second Vice-President	HUDSON W. REED	Philadelphia, Pa.
Treasurer	EDWARD F. BARRETT	Mineola, N. Y.
Assistant Treasurer	V. T. MILES	Mineola, N. Y.
Managing Director	H. CARL WOLF	New York, N. Y.
Secretary	KURWIN R. BOYES	New York, N. Y.

◀ DEPARTMENT CHAIRMEN ▶

Manufactured Gas Department	HUDSON W. REED	Philadelphia, Pa.
Natural Gas Department	R. H. HARGROVE	Shreveport, La.

◀ SECTION VICE-PRESIDENTS AND CHAIRMEN ▶

Accounting Section	E. F. EMBREE	New Haven, Conn.
Residential Gas Section	J. J. QUINN	Boston, Mass.
Industrial & Commercial Gas Section	HARRY A. SUTTON	Newark, N. J.
Manufacturers' Section	FRANK H. ADAMS	Toledo, Ohio
Publicity & Advertising Committee	CHARLES A. TATTERSALL	Syracuse, N. Y.
Technical Section	LESTER J. ECK	Minneapolis, Minn.

◀ DIRECTORS ▶

R. G. BARNETT	Portland, Ore.	LYLE C. HARVEY	Cleveland, Ohio
WALTER C. BECKJORD	Cincinnati, Ohio	D. A. HULCY	Dallas, Texas
ARTHUR F. BRIDGE	Los Angeles, Calif.	HENRY H. MORSE	Gardner, Mass.
FLOYD C. BROWN	Chicago, Ill.	NORTON McKEAN	Albany, N. Y.
JAMES A. BROWN	New York, N. Y.	E. P. NOPPEL	New York, N. Y.
CHARLES M. COHN	Baltimore, Md.	C. E. PAIGE	Brooklyn, N. Y.
E. H. EACKER	Boston, Mass.	J. FRENCH ROBINSON	Cleveland, Ohio
HENRY FINK	Detroit, Mich.	HERMAN RUSSELL	Rochester, N. Y.
R. E. FISHER	San Francisco, Calif.	A. H. STACK	Tampa, Fla.
J. N. GREENE	Birmingham, Ala.	T. J. STRICKLER	Kansas City, Mo.
H. E. HANDLEY	Jackson, Mich.	E. J. TUCKER	Toronto, Ont.
		P. S. YOUNG	Newark, N. J.

◀ ASSOCIATION STAFF ▶

Managing Director	H. CARL WOLF	Director of Promotion	JOHN H. WHITE, JR.
Assistant Managing Director	JOHN W. WEST, JR.	Director, New Freedom Gas Kitchen Program	H. VINTON POTTER
Assistant Managing Director and Director, Natural Gas Dept.	GEORGE H. SMITH	Director, Advertising	CHARLES W. PERSON
Secretary	KURWIN R. BOYES	Director, Publicity	GEORGE A. McDONALD
Secretary, Manufactured Gas Dept. and Technical Section	A. GORDON KING	Director, Statistical Bureau	WALTER E. CAINE
Controller and Secretary, Accounting Section	O. W. BREWER	Director, Testing Laboratories (Cleveland, Ohio)	R. M. CONNER
Secretary, Industrial and Commercial Gas Section	MAHLON A. COMBS	Supervisor, Pacific Coast Branch Laboratories (Los Angeles, Calif.)	W. H. VOGAN
Secretary, Residential Gas Section	F. W. WILLIAMS	Coordinator of General Research	EUGENE D. MILENER
Home Service Counsellor	JESSIE McQUEEN	Secretary-Coordinator, Gas Production Research Committee	EDWIN L. HALL
		Fuel Consultant (Washington, D. C.)	GEORGE W. BEAN
		Utilization Engineer	C. GEORGE SEGELER

Editor, A. G. A. MONTHLY — JAMES M. BEALL

PRINTED IN U. S. A.